

PUBLIC HEALTH PROBLEMS

in 14 French Speaking Countries
in Africa and Madagascar

*A SURVEY
of Resources and Needs*

Volume II

DIVISION OF MEDICAL SCIENCES
National Academy of Sciences
National Research Council



**PUBLIC HEALTH PROBLEMS IN 14 FRENCH-SPEAKING COUNTRIES
IN AFRICA AND MADAGASCAR**

A Survey of Resources and Needs

Volume II

**Division of Medical Sciences
National Academy of Sciences—National Research Council
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This is the second volume of a report entitled "Public Health Problems in 14 French Speaking Countries in Africa and Madagascar—A Survey of Resources and Needs" that has been prepared under Contract AID/afr-287 between the Agency for International Development and the National Academy of Sciences. The first volume was in two parts covering respectively, the organization and programs and the major health problems pertinent to these countries in general or to groups of them. Volume II supplements this general inventory with details about each individual country. Included are the table of contents of both volumes for convenience of cross reference.

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Acronyms Used in Volume II

- EEC - European Economic Community (Common Market)
- FAC - Fund for Aid and Cooperation
- FAO - Food and Agriculture Organization (UN)
- FED - Fonds européen de développement (EEC)
- IBRD - International Bank for Reconstruction and Development (World Bank)
- IDA - International Development Association (affiliate of World Bank)
- IEMVT - Institut d'élevage et de médecine vétérinaire des pays tropicaux
- ILO - International Labor Organization (UN)
- IRHO - Institut de recherches pour les huiles et oléagineux
- OAU - Organization of African Unity
- OCAM - Organisation commune africaine et malgache
- OCCGE - Organisation de coordination et de coopération pour la lutte contre les grandes endemies
- OCCGEAC - Organisation de coordination et de coopération pour la lutte contre les grandes endemies en Afrique centrale
- OMNES - Organisation médicale mobile nigérienne et d'éducation sanitaire
- ORANA - Office de recherches sur l'alimentation et la nutrition en Afrique (OCCGE)
- ORSTOM - Office de la recherche scientifique et technique outre-mer
- UAMCE - Union africaine et malgache de coopération économique (replaced by OCAM)
- UDEAC - Union douanière et économique de l'Afrique centrale
- UDEAO - Union douanière des Etats de l'Afrique de l'Ouest
- UN - United Nations
- UNESCO - United Nations Educational, Scientific and Cultural Organization
- UNICEF - United Nations Children's Fund
- UNTA - United Nations Technical Assistance
- WHO - World Health Organization

PART III

SURVEY OF INDIVIDUAL COUNTRIES

West Africa

Republic of Dahomey
Republic of Ivory Coast
Islamic Republic of Mauritania
Republic of Niger
Republic of Senegal
Republic of Upper Volta
Republic of Guinea
Republic of Mali

Equatorial Africa

Central African Republic
Republic of Chad
Republic of the Congo (Brazzaville)
Gabon Republic

Former Trusteeships

Federal Republic of Cameroun
Republic of Togo

Madagascar

Malagasy Republic

Table 7

Medical and Paramedical Personnel and Population in
Madagascar and Specified Countries of Africa

	Population (in millions)	Density per sq. mile	GNP per capita (estimate)	Physicians*		Dentists	Pharmacists	Nurses	Assistant Nurses	Midwives	Assistant Midwives	Other public health per- sonnel
					Per pop.							
Dahomey	2.25	46	\$ 70	85	1:26,500	5	15	175	640	169	-	-
Ivory Coast	3.66	29	\$200	180	1:20,000	10	65	1881	-	103	-	-
Mauritania	1.0	2-3	\$111	26	1:40,000	-	-	133	-	4	-	-
Niger	3.3	6-7	\$50-75	50	1:66,000	3	3	25	450	24	-	-
Senegal	3.36	43	\$180	173	1:19,400	19	49	739	-	151	-	-
Upper Volta	4.7	42	\$ 45	58	1:81,000	1	10	825	39	22	70	-
Guinea	3.25	34	\$ 85	132	1:24,700	11	7	1184	-	83	-	-
Mali	4.6	10	\$65-70	103	1:45,000	6	7	102	841	60	-	-
Central Afri- can Republic	1.5	5	\$50-90	37	1:40,500	1	2	438	-	44	-	150
Chad	3.3	7	\$ 55	41	1:80,500	1	3	768	-	11	-	-
Congo	.85	6	\$50-150	57	1:15,000	4	14	75	926	19	3	5
Gabon	.63	6	\$110-200	79	1:8,000	3	2	71	557	8	5	-
Cameroun	5.0	27	\$ 92	183	1:27,300	13	28	765	-	41	450	-
Togo	1.6	74	\$75-80	60	1:27,000	5	16	350	-	83	104	68
Madagascar	6.0	26	\$110	600	1:10,000	30	72	157	1482	511	-	-

* Includes physicians in private practice except in Guinea, Mali, Central African Republic, Chad and the Congo.

Table 8

Health Establishments and Equipment in
Madagascar and Specified Countries of Africa

	Beds		General hospitals	Maternity clinics	Medical centers	Dispensaries	Infirmaries and polyclinics	Leprosaria	Maternal and child health centers	Laboratories	Ambulances and other vehicles
	Number	Per population									
Dahomey	2742	1:820	3	46 ^a	30	154 ^b	2 ^b	6	8 ^a	32	155
Ivory Coast	6600	1:550	11	c	51 ^d	179 ^c	-	12	-	16	-
Mauritania	530	1:1900	4	15	15	50	-	-	8	-	21 ^e
Niger	1800	1:1834	3	22	22 ^f	102	-	1	4	-	-
Senegal	4500	1:750	8	39	38	260	-	-	77	3	210
Upper Volta	2900	1:1620	3	41	26	119	-	12	-	-	-
Guinea	6843	1:475	21	18	-	158	-	23 ^g	36	-	-
Mali	3400	1:1350	10	43	36	230	-	7	42	1	4
Central African Republic	1911	1:785	2	32	20	67	18	-	18	-	-
Chad	3380	1:975	4	17	25	89	18	3	-	-	13
Congo	4538	1:190	2	30	15	108	28	-	9	2	38
Gabon	3667	1:170	5	-	27	79	1	6 ^h	-	2	92
Cameroun	10,868	1:460	25	7	58	354 ^b	b	37	-	-	-
Togo	3800	1:425	17	17	-	151	2	2 ⁱ	-	-	-
Madagascar	15,710	1:382	12	137 ^j	146	102	306	-	144	9	331

a - child health centers included under maternity clinics

b - some infirmaries included under dispensaries

c - maternity clinics included under dispensaries

d - plus one antituberculosis center

e - not including 27 vehicles given by AID in 1964

f - plus three antituberculosis centers

g - includes some trypanosomiasis treatment centers

h - plus two trypanosomiasis treatment centers

i - plus three trypanosomiasis treatment centers

j - within the medical centers

REPUBLIC OF DAHOMEY

Population:	2.25 million	Number of doctors:	85
Area:	44,290 sq. mi.	Doctors per population:	1:26,500
Capital:	Porto Novo	Hospital beds:	2742 or 1:820

GENERAL

Geography and topography. One of the smallest states of western Africa, Dahomey has an area of 44,290 square miles (about the size of Pennsylvania). Consisting of a narrow strip of land 415 miles long and 77 miles wide, Dahomey is located between Nigeria and the Republic of Togo and has boundaries with Upper Volta and Niger in the north. The country can be divided into four geographical regions. The coastal strip on the Gulf of Guinea is sandy; there is no natural harbor. The lagoon region to the north of the coast consists of an interconnecting chain of lagoons and lakes extending from Lagos (Nigeria) to Togo. There are only two outlets to the sea, at Grand Popo and at Cotonou. Lower and central Dahomey is a plateau of ferruginous clay with a few isolated mountains, while the fourth region, in the north, consisting of a plateau of granite and gneiss, includes the Atacora chain (1100-3000 feet) and the fertile plains belonging to the Niger River basin.

The climate in the southern part of Dahomey is equatorial, hot and very humid, with temperatures varying between 72° and 93°. There are two dry seasons: November to April and July to September, a major rainy season from April to July and a short one from September to November. In the north, the humidity gradually decreases. There are only two seasons—a dry season, October-April, and a rainy season, April-October.

Population. The population (originally based on a sample survey May-September 1961) was estimated (mid-year 1963) at 2,250,000. About 45 per cent of the population is under 15 years of age. The growth rate is believed to be high; based on a low estimate of 2.2 per cent per annum, the total population by 1985 would reach 3,615,000, the school-age population (6-14 years of age) 875,000 and the active male population (15-59 years of age) 927,000.

The average density of population, one of the highest in West Africa, is 46 per square mile; it varies from 270 in the Cotonou and Porto Novo area to as low as 10 in the north. About 59 per cent of the population lives in the three southern departments and the district of Abomey which account only for 15 per cent of the total area. The main towns are: Cotonou (110,000 inhabitants), Porto Novo, the capital (70,000), Abomey (23,000) and Ouidah (19,000).

Among the 46 ethnic groups recognized officially, there are six main groups. The Fons or "Dahomas," excellent farmers, forming the majority in the south of Dahomey, with about 850,000 inhabitants; the Adjias or Adjon accounting for about 220,000 living in the western part (along Mono and Couffo rivers); the Baribas in Upper Dahomey who grow shea trees* and kapok; the Yorubas or Nagots who came

*Shea tree - Butyrospermum parkii.

from Nigeria and settled along the eastern boundary of Dahomey; the Aizos (about 90,000) concentrated around Cotonou; and the Sambas (90,000) living west of the Atacora chain.

Rural population accounts for 90 per cent of the total. The distribution by religion (1961) included: 65 per cent animists, 12 of catholics, 3 of protestants and 13 per cent Moslems.

Prior to 1960, many Dahomeans served in the other countries of the former federation as civil servants, teachers or accountants. After independence, most of them lost their positions and had to return to Dahomey. About 50,000 Dahomean migrants work at present on plantations and farms in Togo and Ghana.

Government. The Republic of Dahomey became independent on August 1, 1960. In October 1963, the Army, under General Soglo, overthrew the government and President Maga resigned. A new constitution was adopted. Apithy was chosen as President and a new government was set up in January 1964 under Justin Ahomadegbé, as Vice-President of the Republic and Prime Minister. In November 1965, the Army forced the resignation of President Apithy and Vice-President Ahomadegbé and a provisional government was set up by Tairou Congacou. In December, intervening for the third time in two years, General Soglo suspended the constitution, banned political parties and dissolved municipal councils. In January 1966, Dahomey broke relations with Communist China.

Dahomey, a member of the United Nations and its specialized agencies, is also a member of the OAU and the OCAM, an associate member of the EEC and belongs to the West African customs and monetary unions. Dahomey was one of the founding members of the Conseil de l'Entente (see page 24) in 1959 with the Ivory Coast, Upper Volta and Niger.

The country is divided into six departments (Southeast, South, Southwest, Center, Northeast and Northwest) with capitals in Porto Novo (capital of the state), Cotonou, Lakossa, Abomey, Parakou and Natitingou. Each department is under a prefect assisted by a council (conseil général). There are further 32 to 37 sous-prefectures (districts) subdivided into 45 or more arrondissements (sub districts). The towns of Porto Novo, Cotonou, Ouidah, Abomey and Parakou form autonomous urban circonscriptions, each under a chief of circonscription assisted by a municipal council.

Education. Not less than 16 per cent of the 1965 operating budget of \$33.5 million was provided for education. School attendance in the southern part of the country is among the highest in Africa, the national average (1963-1964) being 24 per cent of the school-age population. There were (1963-1964) 114,000 pupils in 605 primary schools of which 257 were private. A total of 8615 students were enrolled in 45 secondary educational institutions (of which 31 were private) and about 800 studied in 5 technical schools. The number of university level students studying abroad is estimated at 700. About 300 of these were enrolled at the Dakar University including 17 medical students.

The good quality of education and the high level of school attendance have benefited mainly the urban areas and already have created in towns a problem of employment of those unwilling to return to rural areas.

In accordance with an agreement (July 1965) between Togo and Dahomey, the

Institut d'enseignement superieur du Benin will insure the undergraduate training for university studies at Lomé (for letters) and at Cotonou (sciences). There were 50 students at Cotonou.

ECONOMIC RESOURCES

The economy is almost exclusively based on agriculture and about nine tenths of the resources come from vegetable oils, palm kernels and peanuts. The GNP was estimated (1964) at about \$140 million and the per capita income was about \$70 per year.

Crops produced primarily for domestic consumption include manioc (1,200,000 metric tons in 1964), yams (600,000 tons), corn (225,000 tons), sorghum, millet, rice and beans. Industrial and export crops include palm kernels (50,000 tons) and palm oil (36,000 tons), peanuts (16,000 tons of which 10,000 consumed locally), shea nuts, coffee, cotton and castor bean.

Livestock is not sufficient for local needs. There were in 1963, 370,000 head of cattle, 907,000 sheep and goats and 302,000 pigs. Several breeds of livestock exist in the north while in the south the tsetse fly restricts the breeding to the small lagoon cattle. A U.S. AID assisted project aims at the development of breeding the lagoon cattle (30,000 head).

Fishing is an important industry employing about 100,000 persons of whom about one quarter live exclusively from fishing. In 1963, river fishing brought 5000 tons, fishing in the lagoons 20,000 tons and maritime fishing 6200 tons. It is estimated that the gross revenue from maritime fishing is about \$4 million. Its development will await the opening of the fishing port at Cotonou and the creation of cold storage facilities.

Industry accounts for a very small part of the country's national product. It includes five palm oil processing plants and small privately-owned industries which produce beer, soft drinks, nails, bricks and concrete block. There are two soap factories and printing plants. The total value of industrial products in 1965 was expected to reach \$5.3 million.

The total available electric power of about 6700 kw is produced by diesel generators and marketed by a private company. The UN Special Fund is financing studies for developing hydroelectric power on the Mono River to serve both Dahomey and Togo.

The deep-water port of Cotonou, opened in 1965, will provide a capacity of one million tons per year. In 1964, about 276,000 tons were handled by the single pier of Cotonou. About one third of all imports were destined for Niger.

The road network is important covering about 3700 miles; of these the east-west road Lagos-Abidjan is surfaced and the south-north road Cotonou-Niger is partly surfaced. There were in September 1964 about 10,000 motor vehicles in the country.

Dahomey has 360 miles of railroad (one meter gauge). The main line runs from Cotonou to Parakou and a branch line to Porto Novo and Pobé. The railway and the old wharf at Cotonou are managed by the bi-national (Niger-Dahomey) state-owned company (OCDN). The future of this collaboration will depend on the extension of

the railway northward to Dosso in Niger.

The value of exports in 1963 was about \$12.8 million of which oil palm products accounted for about two thirds of the total; the value of imports was \$33.4 million. France's share in 1963 was 71.5 per cent of Dahomey exports and 61.1 per cent of the imports. Dahomey's unfavorable trade balance, recorded every year since 1958, was acutely aggravated in 1962 and reached a record gap in 1963.

NATIONAL BUDGET

In 1965, Dahomey's estimated operating budget totalled \$33.5 million of which \$3.9 million, or 12 per cent, accounted for health services. Based on an estimated population figure of 2.25 million, the average per capita for health services was \$1.75. The following table gives budget data for the last five years (in thousands):

Year	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health costs Per Capita*
1961	\$25,636	\$3,863	15	\$1.70
1962	25,567	3,521	14	1.55
1963	27,100	3,485	13	1.55
1964	28,985	3,436	12	1.55
1965	33,494	3,946	12	1.75

* Based on an estimated population (mid-year 1963) of 2.25 million.

The financial situation of Dahomey is somewhat alarming and may explain to some extent recent political events. The unfavorable trade balance, steady per capita decrease of exports and the rising share of consumers goods in Dahomean imports—did not deter the government from adopting the 1965 budget with a 15 per cent increase in expenses over the previous year. The cost of personnel which accounted for 51.6 per cent of the total in 1960 has reached 61.7 per cent in the 1965 budget. In June 1965, the chief of the Government (Ahomadegbé) declared that the expenditures during the year would reach \$34.4 million, the revenue was estimated at \$24.3 million while France's support of the budget would be \$3 million leaving an estimated deficit by the end of the year of \$7.1 million. The government lowered salaries of civil servants but did not reduce their excessive numbers.

ASSISTANCE PROGRAMS

Bilateral. France's support to the regular budget of Dahomey amounted to \$4.9 million in 1961, \$4.1 million in 1962, \$3.8 million in 1963 and \$3 million in 1964 and 1965. In October a loan of \$1.2 million was granted for several development projects, mainly in the palm oil industry. French investment in the health activities of Dahomey through the FAC from 1959 to February 25, 1964 amounted to \$2.2 million. These commitments relate to the hospital at Cotonou (\$1.8 million) and for the campaign against the endemic diseases (\$406,000). (See Table 2, Volume I.)

U.S. AID documents refer to technical cooperation development grants of \$534,000 during FY 64 and \$574,000 in FY 65 including \$341,000 for food and agriculture. (These presumably relate to the cattle breeding and rinderpest control projects and a reforestation project.) Except for the measles control project in FY 65, none of the assistance was in the field of public health.

West Germany opened a credit of \$3 million of which \$1,165,000 was awarded up to the end of 1963. The assistance included mainly vehicles, medical supplies and technical advice in the field of road building, housing development and agriculture.

Assistance by the USSR seems to be mostly in training Dahomeans at technical schools and universities in the USSR. It is known that the USSR sponsored the poliomyelitis vaccination program.

Switzerland's assistance was provided in setting up a number of rural production cooperatives.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in Dahomey totalled \$18.7 million for 18 projects. Of this amount, health and sanitation projects amounted to \$6.1 million (see Table 3, Volume I). The investment program for health infrastructure, amounting to \$1 million of the \$6.1 million, related to the school of nursing at Cotonou (\$222,000); hospitals at Savalou (\$107,000) at Athiéme (\$67,000) and at Parakou (\$594,000); and supplies for buildings destined for health services (\$87,000).

Project costs of the United Nations Expanded Program of Technical Assistance for Dahomey in 1964 totalled \$271,409. Some of these projects included assistance from UNTA for natural resources development and power, public administration and economic programming (\$22,215); from ILO for small-scale industry, social security and labor conditions and administration (\$39,203); from FAO for plant and animal production, rural institutions and services, fisheries development, nutrition and land and water development (\$104,253); from UNESCO for mass communication, the Pedagogical institute, national libraries, science teaching and teacher training (\$55,133); and from WHO for environmental health and public health administration (\$20,574). Eighteen experts were involved in these projects and 27 fellowships were awarded nationals.

In November 1965, the UN Development Program/Special Fund recommended a project for pilot development of groundwater at the cost of \$1,109,500 to be spent over a three-year period. The project will provide groundwater for irrigation in the south, drinking water for villages further north and for the establishment of a special groundwater service.

WHO assistance program for 1965 (see Table 9) provided for an estimated obligation of \$88,500 from the regular budget, of which \$36,000 was for the malaria pre-eradication program and \$21,000 for teaching activities in connection with environmental sanitation. In addition, \$85,000 was obligated from other extra-budgetary funds.

UNICEF provided funds for projects relating to the national sanitation program, yaws and leprosy control and applied nutrition (see Table 10).

ORGANIZATION OF HEALTH SERVICES

Public health, formerly part of a Ministry for Health and Social Affairs, was from January 1964 to December 1965, the sole responsibility of the Ministry of Public Health located at Cotonou. The Ministry of Public Health and Social Affairs was re-established in December 1965. The Director of Public Health responsible to the Minister (recently Dr. D. Badarou) is in charge of the directorate which includes four bureaus: Personnel, technical studies, administration and pharmacies and the preventive medicine service (Service national des grandes endemies).

The medical and health equipment of the country includes 2 main hospitals at Cotonou and Porto Novo with 350 beds each, a hospital at Parakou, 30 medical centers, 46 maternity clinics and child care centers, 154 dispensaries and infirmaries and 6 leprosaria. The total number of beds was 2742 or about 1 bed per 820 inhabitants. There are further two tuberculosis dispensaries and school medical services at Cotonou and Porto Novo and mobile medical and ambulance services.

The organization of peripheral health services provides for medical circscriptions (each with a medical center) corresponding more or less to the 32 to 37 administrative sous-prefectures (districts). These regional services have not yet been completed owing to the shortage of medical personnel. The Service national des grandes endemies subdivided the country into three sectors—south, center and north, each with its own mobile units and fixed treatment posts.

In 1961, there were in Dahomey 85 physicians (9 of whom in private practice) corresponding to 1 per 26,500 inhabitants, 5 dentists, 15 pharmacists, 10 fully qualified nurses, 165 certificated nurses, 640 assistant nurses and 169 midwives.

Considerable efforts are being made by the Government to increase the number of technical health personnel; 25 newly trained Dahomean physicians (including 7 specialists), 12 pharmacists, 16 nurses and 12 midwives were expected from France between 1962 and 1965. The national school of nursing (Ecole nationale des Infirmiers d'Etat) created in 1961 was expected to train 30 nurses per year and, funds permitting, gradually expand to reach 100 nurses per year.

PUBLIC HEALTH PROBLEMS

The control of endemic diseases, the development and staffing of peripheral health services and environmental sanitation are the priority tasks of Dahomey. A WHO public health adviser initiated an inventory of public health facilities of the country required for further development of basic health services on which the future malaria eradication will be built. Information on malaria pre-eradication activities and yaws and leprosy programs are referred to in Table 9.

Yaws has been cleared from previously hyperendemic foci in northern Dahomey by penicillin campaigns in the 1950's but remains endemic in the south, where the climate is favorable.

Leprosy is still a serious problem; there were in June 1965, 28,233 cases requiring treatment of which 43.6 per cent were treated regularly.

Sleeping sickness occurs only in the northern (savannah) zone, and less than 100 new cases are diagnosed annually, in some 350,000 examinations. Smallpox may be difficult to eradicate in the south of Dahomey, where there have been strong objections to vaccination. This position may be altering for the better: 247,553 vaccinations were performed in 1963 and 318,709 in 1964 in the country as a whole. In 1964, there were 174 known smallpox cases with 33 deaths in Dahomey.

Onchocerciasis is currently under epidemiological and entomological investigation. There are known foci in the regions of Natitingou and Ouémé, with high blindness rates. Other foci exist along the border with Togo, and there is a grave suspicion that new foci are developing further south. This could become a very serious health problem in the future.

There is no information on the prevalence of bilharziasis, but there is no doubt that at least Schistosoma haematobium occurs in both north and south. Southern Dahomey is interspersed with freshwater lagoons, much frequented by fishermen and children: many villages are completely surrounded by water, and all their traffic with the outside world is conducted by boat.

* * * *

The preparation of a comprehensive plan of action for the development of peripheral health services and the establishment of a demonstration zone in public health, with WHO assistance, are important targets for the government in the near future. Economic and political difficulties may affect the schedule of some projects now in progress.

Table 9

Estimated WHO Commitments in Dahomey, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	3	3	3	\$ 36,083	\$ 47,758	\$ 47,549
Public Health Administration	1	-	-	6,000	-	-
Public Health laboratory methods	-	-	-	3,200	12,000	-
Vital and health statistics services	-	-	-	800	8,000	3,400
Fellowships (nursing)	-	-	-	8,000	8,000	12,000
Mental health	-	-	-	4,800	1,700	-
Environmental sanitation	1	1	1	21,116	19,306	27,709
Fellowships	=	=	=	<u>8,500</u>	<u>8,000</u>	<u>16,000</u>
Total	<u>5</u>	<u>4</u>	<u>4</u>	<u>\$ 88,499</u>	<u>\$104,764</u>	<u>\$106,658</u>
Other obligations				\$ 85,000	\$ 73,000	\$ 98,000

MALARIA PRE-ERADICATION PROGRAM (1964-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Dahomey can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

The program was implemented by mid-1964 with the assignment to the malaria service of the national malariologist, a sanitarian and a limited number of microscopists and entomological field staff. A new construction was made available by the Government to the malaria service.

Malarionetric surveys were carried out until the end of December 1964 to assess the epidemiological situation of the country. The parasitological survey carried out in the departments of south and southeast covered 62 villages and the survey carried out in the departments of the northeast and northwest covered 245 villages.

The difference in parasite rates between the northern part of the country and the southern is certainly due to the presence in the latter of a better

network of health establishments, to a tendency for the population to live in agglomeration and perhaps to the results of the former coverage with residual insecticides.

Training of personnel included a number of microscopists for the malaria service and other field staff.

The public health adviser began in June 1964 the preparation of an inventory of public health facilities existing in the Republic. He began the preliminary surveys in the northern region. He has assisted in the training of auxiliary health assistants in the circonscription of Cotonou by giving lectures on health education. Assistance has been given to the Government in the preparation of a plan of action for the development of health services at the peripheral level and he has made investigations with a view to the establishment of a demonstration and operational research zone in public health.

In November 1964 a first malaria coordination meeting of pre-eradication programs was held in Togo at which Dahomey was represented by the public health adviser. The outcome of this meeting indicated the necessity for close coordination between pre-eradication programs in neighboring countries. The second of these meetings was held in Cotonou in March 1965 with the participation of representatives of Togo and Ghana projects.

VITAL AND HEALTH STATISTICS SERVICES (- 1967). To advise on the organization and development of statistical services in the Ministry of Health (short-term consultant for two months in 1967).

ENVIRONMENTAL SANITATION (1961-1967).* To assist in the organization of sanitation services.

The WHO engineer has continued to give courses on the fundamental principles of environmental sanitation at the Ecole nationale des Infirmiers d'Etat, Cotonou, and also refresher courses for the health assistants of the Circonscription Médicale of Cotonou. The high school graduate sent in September 1963 to the University of Ghana, continues his civil engineering training, which will be followed by specialization in sanitary engineering.

Several working sessions have been held in order to start work in the pilot zone of Adjarra. The improvements to the main market, Porto-Novo, have begun and consist mainly of the distribution of drinking water and the construction of public latrines.

The WHO engineer provided interim supervision for the neighboring project in Togo from December 1964 to February 1965. He was transferred to another project in April 1965, and since then the engineer assigned in Togo has serviced the project in Dahomey. This project is behind schedule in achieving the objectives laid down in the plan of operations.

OTHER WHO PROJECTS

BASIC HEALTH SERVICES AND COMMUNICABLE DISEASES CONTROL (- 1967).* To assist yaws and leprosy control activities.

*This project receives UNICEF assistance.

UNICEF assistance to treponematoses control and leprosy control continued. The WHO adviser in the yaws control project in Togo visited Dahomey in December 1964 and submitted a summary report giving the following information:

(1) Yaws: An initial treatment survey for yaws had been carried out between 1956 and 1960 during which 714,354 persons out of a population of 1,049,000 or 68 per cent were examined. During a first resurvey (1960/1962) 527,167 persons out of an estimated 1,026,000 (51 per cent) were re-examined and 6012 cases of yaws (1.1 per cent) were diagnosed. Since January 1963 a second resurvey has been underway and by the end of 1964, some 418,000 persons had been re-examined and 1568 cases of yaws diagnosed (0.4 per cent). During these resurveys juvenile mass treatment was employed. The WHO adviser recommended continuation and conclusion of the second resurvey and subsequent integration of the yaws control project into the existing basic health services.

(2) Leprosy: Leprosy control work is being carried out by the Service des Grandes Endemies. The country is subdivided into three sectors (northern, center, and south) each of which is serviced by several mobile circuits (car, motorcycle or bicycle) and a number of fixed treatment centers. In the northern sector there are also two leprosaria. The sectors are under the supervision of leprosy control officers. Between January and September 1964 a total of 2657 new cases of leprosy were diagnosed out of an examined population of 38,073. The WHO adviser recommended more regular bacteriological examinations, especially of lepromatous patients. Simple physiotherapeutic measures should be employed and taught to the patients to counteract the consequences of nerve damage. Leprosy control work should be integrated into the existing public health infrastructure and especially in the fixed rural health centers.

OTHER WHO PROJECTS

ASSISTANCE IN THE EXPANSION OF THE WATER SUPPLY OF COTONOU (March 1964-June 1965). To assist in undertaking engineering studies for expansion of the Cotonou water supply and preparation of a feasibility report, to assist the Government to prepare a loan request to finance the project.

The project has been completed. The report submitted by the hydrogeological expert has been reviewed and finalized during a visit of the Regional Adviser to Dahomey in November 1964.

The engineering report of the consulting firm has also been finalized after discussions of its contents between the engineering firm and WHO. This report presents a program for the expansion of the water supply system of Cotonou to cover the needs of the city for the next 30 years.

The Government intends to contact FED with a view to obtaining funds for the financing of the project.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular budget was allocated by MESA for the years 1965 to 1967 successively \$8000, \$3000 and \$3000.

Table 10

UNICEF-Aided Projects in Dahomey, 1960-1964

Total allocation: \$262,000

ENVIRONMENTAL SANITATION	Approved 1962 \$ 26,000
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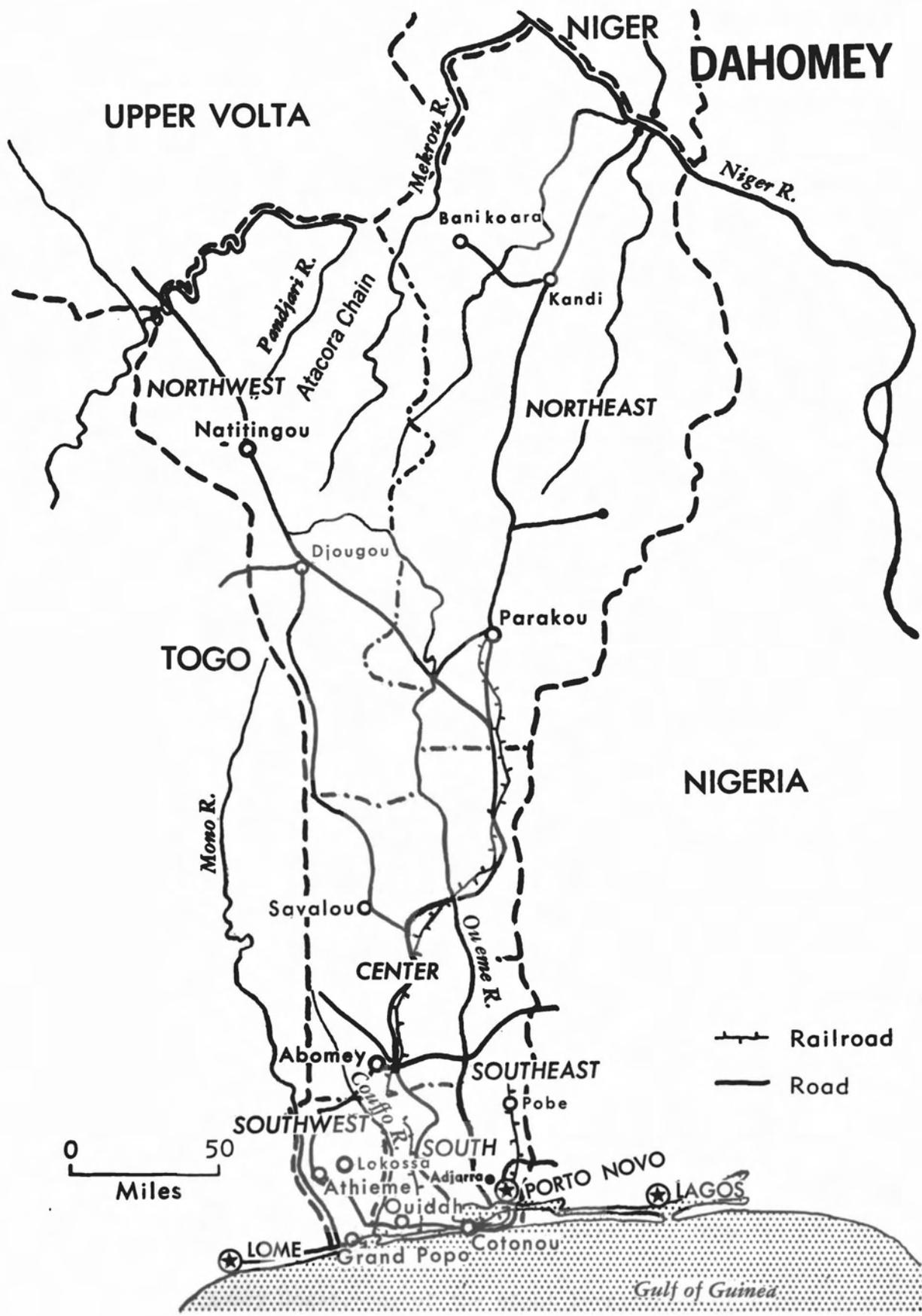
In connection with the national sanitation program and establishment of a demonstration zone, UNICEF provided training material, survey and laboratory equipment, equipment for well construction and vehicles. A WHO sanitary engineer serves on this project.

YAWS/LEPROSY CONTROL	Approved 1960 \$ 131,000
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Yaws resurvey work in 1964 was combined with leprosy control work within the endemic disease control program. UNICEF provided penicillin, vehicles and campaign equipment and, for the leprosy control, drugs, injection equipment and vehicles.

APPLIED NUTRITION	Approved 1961 \$ 105,200 Additional commitment 51,000
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National Food and Nutrition Service (Section dahoméenne d'Alimentation et de Nutrition appliquée, SDANA) comprises personnel of the ministries of health, education and agriculture. Project involves pilot dairy and poultry farms, promotion of fish consumption and the use of supplementary foods. UNICEF is providing equipment, material for small animal raising, fisheries, school gardening, school canteens, high protein foods (ground-nut flour and smoked fish), vehicles and stipends. FAO furnished services of a nutritionist (1962-1963).





REPUBLIC OF IVORY COAST

Population:	3,665,000	Number of doctors:	180
Area:	126,000 sq. mi.	Doctors per population:	1:20,000
Capital:	Abidjan	Hospital beds:	6600 or 1:550

GENERAL

Geography and topography. Ivory Coast is situated on the Gulf of Guinea. It is more or less square in shape and has an area of about 126,000 square miles (slightly larger than New Mexico). It is bounded on the west by Liberia and Guinea, in the north by Mali and Upper Volta and on the east by Ghana. In the south, the land is fringed by a string of coastal lagoons and rises gradually northwards to about 1000 feet; higher mountainous areas are found along the western boundary. The southern third of the country is located within the tropical rain forest zone while the northern part is within the wooded and grassy savannah belt. Rainfall in the south averages 80 to 95 inches per year, with rain every month; further north the length of the wet season decreases, monthly variations are more marked and the annual average is about 44 inches.

Population. In 1963, the population was estimated at about 3,665,000, with an average density of 29 persons per square mile. Over much of the northeast and southwest the average density is below 10, while densities of more than 50 persons per square mile are found around Abidjan, and in the areas around Bouake, Gagnoa and Korhogo. In 1961, the birth rate was believed to be 56 per 1000 and the general mortality 33.3 per 1000 population. Based on a sample survey (1957-1958) and a subsequent estimate (1963), the annual increase of the population was 2.3 per cent. The total population of the Ivory Coast is expected to reach by 1985 a total of 6,140,000, the school-age population (6-14 years of age) 1,410,000 and the active male population (15-59 years of age) 1,585,000.

The growth of population in the cities is considerable and is exceptionally high for Africa in Abidjan, where the annual growth rate has reached 9 per cent (1955-1963). The population of the city was 254,000 in March 1963 and is expected to reach 500,000 by 1970. Outside of Abidjan only Bouake and Bouafle have more than 45,000 people, followed by Man (17,000), Gagnoa (15,000) and Abengourou and Korhogo (19,000 each). The official language of Ivory Coast is French. More than 60 different languages are spoken in the country.

Among the numerous ethnic groups the largest numerically is the Baule in the southeast, estimated at 700,000, followed by the Krou (500,000) in the southwest, the Senoufo (500,000) in the north, the Mandingo (450,000) in the northwest and the Dan-Gouro group (400,000) in the west. Ivory Coast has a substantial number (about 150,000) of Africans from other countries, among whom the largest group is the Mossi from Upper Volta. In 1962 there were 18,000 non-Africans, of whom the French form the largest group.

Moslems account for 23.5 per cent of the population, animists for 64 per cent and Christians for 12.5 per cent.

Government. Ivory Coast, one of the eight territories of former French West Africa, joined the French Community in 1958 and became a republic on December 4,

1958. Dr. F. Houphouët-Boigny, its first prime minister and chief of state, was elected president when Ivory Coast became independent on August 7, 1960.

The form of government under the constitution is presidential within the framework of separation of powers. The president is elected for a five-year period and is also the prime minister.

Ivory Coast is a member of the United Nations and its specialized agencies and an associate member of the European Economic Community. It is a member of OAU, OCAM, the West African customs and monetary unions, and is one of the founder states of the Conseil de l'Entente, which comprises the heads of government of Dahomey, Ivory Coast, Niger and Upper Volta (see page 24).

For the purpose of local administration, Ivory Coast is divided into six départements or prefectures, each subdivided into a number of sub-prefectures. Abidjan, the capital of the country, is also the seat of the Southern prefecture. The names of the other five prefectures with their seats are: Northern (Korhogo), Central-West (Daloa), Central (Bouaké), Eastern (Abengourou) and Western (Man). Abidjan, Bouaké and Grand-Bassam are autonomous municipalities with elected municipal councils.

Education. Educational facilities have a high priority in planning for the future, but the government intends to expand the school system at a rate dictated by the expansion of the economy. There is no risk at present of an excess of trained workers which the economy could not absorb.

Education accounted for 15 per cent of the total government operating budget in 1964 and reached 17.6 per cent (or \$22.9 million) in 1965. Under technical assistance, France is providing the services of 830 teachers and administrators for education (December 1964).

In 1963-1964, there were about 330,000 pupils in 1877 primary schools. All teachers were Africans from Ivory Coast. School attendance in 1963 was 55 per cent. In spite of the substantial increase in school attendance since 1950 about 80 per cent of the population was illiterate in 1962.

Secondary education is provided to some 20,200 students in 69 schools, of which 22 are private. The teaching staff includes 898 teachers, of whom 468 were provided by France.

The secondary education establishments are of three categories: schools for teachers (11) and a teachers college (at Daloa); 26 establishments preparing for university studies, including two lycées (at Abidjan and Bouaké); and 31 other high schools of medium level.

Technical training for industry and trade is provided by the Lycée technique of Abidjan, training centers of Bouaké and Treichville and the technical teachers school at Treichville (1742 students). Basic education and training is provided for adults in four rural centers (Gagnoa, Katiola, Oumé, Ferkessedougou) and one at Abidjan.

The number of students in secondary schools has increased enormously since 1950 and in 1963-1964 comprised 7 per cent of the 15-19 years age group. Of the 20,200 students enrolled, most likely only one-fourth will obtain the baccalauréat

which is prerequisite for higher study. In November 1964 there were 1900 students at the University of Abidjan (see page 128), of whom 67 per cent were from Ivory Coast. Thirty-two students from Ivory Coast were admitted for the first three years of medical studies (see page 132). About 1000 students from Ivory Coast study at universities in France.

ECONOMIC RESOURCES

Among the countries under consideration, Ivory Coast has the richest and most advanced economy, based essentially on foreign trade. Its agricultural production is oriented towards export markets, while most consumer goods are imported. Its per capita income is among the highest of the group of 15 states. In 1964, the gross domestic product was estimated at \$800 million and average per capita income at \$200.

Ivory Coast's master economic plan is aiming at a steady rise of per capita income to reach \$500 by 1970, when the economic growth is expected to be sufficient to put an end to any need for foreign aid.

Political stability, realistic planning, close commercial ties with France and the European Economic Community, and a steady flow of investment funds account for the present strength of the economy.

The bases of Ivory Coast's export trade are coffee, cocoa and tropical woods; secondary production are bananas, palm oil and pineapples. Ivory Coast is the world's third largest coffee producer and the fourth largest cocoa producer; tropical woods account for 20 per cent of the value of exports (about 1 million cubic meters of logs in 1963). Major programs of agricultural diversification relate to oil-palm, cotton, rice, coconut and rubber. Cattle and sheep raising, mainly in the northern savannah zone, is limited by the presence of the tsetse fly and meat is imported from Mali and Upper Volta but poultry farming is important. Eggs are exported to the neighboring countries.

Large-scale commercial fishing in the sea and the coastal lagoons is important. The apparently unlimited supply of tuna in the Gulf of Guinea will insure the development of the canning industry. Production of canned tuna is expected to reach 25,000 tons by 1970.

Mining resources consist mainly of industrial diamonds and manganese. Diamonds are mined in the region of Séguéla and Touba; manganese is extracted at Grand-Lahou near the coast but new deposits were discovered recently near Odienné in the north. Columbo-tantalite is mined near Bouaké. Other minerals of possible future significance to the economy are rare metals such as ilmenite, tantalite, beryllium and niobium. Ilmenite fields near Grand-Lahou are believed to be capable of producing 500,000 tons.

Industry, including mining and power, contribute only 4 per cent to the GNP. Food processing accounts for 30 per cent of the total industrial activity, vegetable oil extraction and soap for 20 per cent, wood industry for 15 per cent, textiles for 13 per cent, while mechanical, metallurgical and miscellaneous industries account for the remaining 22 per cent of the national industry.

Since 1960, 23 new industries have been established and 20 more are planned. It is expected that by 1970 industrial production will account for 22 per cent of internal production. Most industries are located around Abidjan and some of them in Bouaké.

Ivory Coast has 380 miles of railroads. Abidjan is connected with Ouagadougou, capital of Upper Volta, by a single-track railroad known as the Abidjan-Niger Railroad, owned jointly by the Ivory Coast and Upper Volta governments.

The network of roads consists of 6600 miles of classified road, of which 400 are hard surface (1961). The main routes from Abidjan are paved for 50 to 150 miles out. Thereafter the main roads are made of hard laterite clay. They are well kept and normally usable throughout the year. All the towns and most villages can be reached by automobile.

In 1961, there were 26,626 motor vehicles in operation, of which 13,732 were passenger cars and 12,894 trucks and buses. These figures are rising steadily.

The main seaport is that of Abidjan. By cutting an opening through the sand bar and constructing the 1.7 miles long Vridi Canal (1952), Abidjan has been transformed almost overnight. The tonnage handled by the port doubled over the period 1958 to 1961. During 1961, 3813 ships unloaded 1,057,000 metric tons and loaded 1,320,000 metric tons. Sassandra is the second port of Ivory Coast; it handled 15,500 tons of merchandise and 100,000 cubic meters of wood in 1960.

Abidjan-Port Bouet international airport is becoming one of the most important air terminals in West Africa.

About 88 per cent of the Ivory Coast's electric power is supplied by hydroelectric installations; the remaining 12 per cent is supplied by thermal plants. The total production in 1964 was about 200 million kilowatt hours. All the hydroelectric power was produced by installations (Ayame 1 and Ayame 2) located on the Bia River. In addition, Abidjan area has 2 thermal units of 6000 kilowatts each; and 2 more units of 12,000 kilowatts each are to be added later. Bouaké has thermal units of 4000 kilowatt hours and a further diesel unit of 2000 kilowatts added in 1963. The cities of Aboisso and Grand-Bassam are supplied by hydroelectric energy. Pending the extension of high tension transport, thermal energy is available at Abengourou, Adzopé, Agboville, Daloa, Dimbokro, Divo, Gagnoa, Korhogo, Man and Sassandra.

In 1964, the production of electric energy increased by 25 per cent while the consumption rose by 28 per cent. The rise of industrial requirements is also shown by the 38 per cent increase of high tension transport of electric energy and an increase of 20-40 per cent of imports of liquid fuels.

NATIONAL BUDGET

The total budget estimates for 1965 were about \$180 million, of which the capital investments were \$51 million and the government operating budget \$129 million. About \$12.4 million or 10 per cent of the latter was provided for health, corresponding to about \$3.40 per capita. The budget estimates of Ivory Coast for the last five years were as follows (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$110,251	\$ 95,146	\$7,275	8	\$2.00
1962	139,128	108,472	9,376	9	2.55
1963	135,460	111,410	9,822	9	2.70
1964	168,173	118,934	12,042	10	3.30
1965	180,208	129,153	12,435	10	3.40

* Based on an estimated population of 3.665 million in 1963.

Estimates of total cost of health and medical services are difficult to make with the available data on current budgets, as these do not include funds received under technical assistance programs.

An analysis of the budgetary estimates for 1963 of seven countries of West Africa was made by the Central Bank of West African States.** The study was made in accordance with UN classification, separating the current operating cost of government from capital investments. The real cost of the central government operation was estimated for 1963 at \$128 million, of which health services accounted for \$13.4 million, or 10.4 per cent of the total. These estimates include the approximate cost of specialized personnel of the technical assistance. As stated, the technical assistance staff is paid by the foreign government or international organization concerned. Estimates of the real costs of health services and of education would be meaningless without the cost of these salaries. Among the seven states of West Africa, Ivory Coast's share of cost of health services is about the average (10 per cent); the highest rate was in Upper Volta (13.6 per cent) and the lowest in Senegal (7.0 per cent).

Based on the above figures, the per capita cost of health service operations in Ivory Coast was \$3.65; instead of \$2.70 as indicated in the table above.

ASSISTANCE PROGRAMS

The capital investment in the health infrastructure under technical assistance programs is considerable. During recent years, France's contribution, through FAC, for that purpose was about \$2,916,000, while FED contributed \$3,375,000. Assuming these amounts were spent over a period of five years (1959-1964), the annual investment would be about \$1.2 million or \$1.70 per capita per year from these two sources alone.

Bilateral. Investment operations in the field of health decided upon by FAC from its establishment to February 1964 involve the expense of \$2,916,000 (see page 44) which covers: Bouaké hospital (\$893,000), laundry for Abidjan hospitals (\$60,000), pediatric pavilion at Treichville hospital (\$264,000), physiotherapy

** Banque Centrale des Etats de l'Afrique de l'Ouest. Bulletin No. 105, avril, 1964.

equipment center (\$100,000), preliminary studies for University Hospital Center (\$264,000), campaign against endemic diseases (\$670,000), rural health units (\$569,000) and purchase of medicines and materials (\$80,000).

The U.S. AID program included assistance in the fields of food and agriculture, education, health and sanitation, public safety and technical support and development loans for highway equipment and the promotion of private enterprise. In FY 63, \$779,000 was committed for development grant projects of which \$65,000 was allocated to health and sanitation. No amount was allocated for this category in FY 64 and FY 65. According to a preliminary report (Appendix 1, Volume I), it was planned to allocate \$175,000 in FY 65 for studies relating to locating and drilling wells.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in the Ivory Coast totalled \$31.4 million for 17 projects. Of this amount, health and sanitation projects amounted to \$6.5 million (see Table 3, Volume I). Of the \$6.5 million, \$1.6 million represents the investment program for health infrastructure involving five new hospitals (375 beds) with five surgical suites and the Pasteur Institute at Abidjan. Since June 30, 1964, the FED has approved a financial commitment of \$1,742,300 for the Institute of Public Health to be constructed in Abidjan. Recently FED provided \$150,000 for 1966 and 1967 for a campaign against onchocerciasis.

Under the United Nations Expanded Program of Technical Assistance, project costs in 1964 totalled \$317,574. These projects included UNTA assistance for natural resources development and power and for public administration (\$61,544); ILO assistance for cooperation and small-scale industry (\$41,272); assistance from FAO for rural institutions and services, nutrition, and development of land, water and fisheries (\$95,541); UNESCO assistance for educational activities and public libraries (\$58,950); and WHO assistance for vital and health statistics, environmental health and public health administration (\$36,547). Nineteen experts and technicians were furnished for these projects and three fellowships were awarded to nationals.

In 1965, the obligations of WHO were, under the regular budget, about \$91,000, in addition to obligations under other budgets (see Table 11) of \$185,000.

UNICEF provided funds for projects relating to yaws and leprosy control, applied nutrition, training of social welfare workers, creation of social centers and mothercraft and homecraft (see Table 12).

ORGANIZATION OF HEALTH SERVICES

The functions of the Ministry of Health and Population were defined as covering three main tasks: (1) public health and demographic matters, (2) environmental health and sanitation, and (3) control of endemic diseases.

The Ministry is responsible at present for the medical care and the improvement of the permanent infrastructure and planning for better distribution of hospital facilities. The Ministry is also responsible for maternal and child health services, school health services, inspection of industrial establishments and restaurants, control of drugs and narcotics and matters relating to the practice of medicine, and for collecting and collating of health and vital statistics.

The organization of the Ministry (based on information as of September 1965)

can be summarized as follows:

The Minister (Dr. N'Dia Koffi) is assisted by a Minister's Office (Cabinet ministeriel) under a director and three technical advisers. Of the latter, two (Drs. Série and Delormas) have also other technical responsibilities.

The technical services of the Direction générale de la Santé publique are under a director general (Dr. Varlet) aided by a senior technical adviser (Dr. Pascal) also responsible for planning and a deputy director general (Dr. Diplo). The directorate general has, in addition to bureaus dealing with budget, finance, personnel and general administration, seven main services (or directions), each under a director: (1) Service des grandes endemies (under Dr. Rives), (2) Hygiène publique et sociale (Dr. Ayé) also responsible for the Institute of Public Health, under Dr. Binson. (3) Pharmacies (Mr. Mangoua), (4) Medical Professions (Dr. Akué), (5) Tuberculosis control (Dr. Delormas), (6) Medical and health institutions (Dr. Nakadia), and (7) Statistics (Dr. Bitty).

The regional organization of health services provides for medical regions (direction départementale de la Santé, DDS) with centers in the capitals of départements.

At present, three such DDS control the peripheral services of the six départements: South and East (Dr. Terrasson, director); West and Center (Dr. Komats); North and Center (Dr. Roux) with headquarters in Abidjan, Bouaké and Daloa.

The control of endemic diseases (Service des grandes endemies) has 6 sectors located in the capitals of the départements and 10 sub-sectors. It controls the leprosy institute at Adzopé and 11 leprosaria (total of beds: 1220), the experimental or training zone of Adzopé and 9 sleeping sickness wards with a total of 245 beds,

The sectors have hospital facilities for the new cases of sleeping sickness and severe cases of leprosy; they maintain records of leprosy, sleeping sickness and treponematoses cases. All sectors and sub-sectors are equipped with a laboratory. The sectors, sub-sectors and the mobile units deal in the first place with case-finding and treatment of leprosy, sleeping sickness and trachoma and with vaccination of the population. These services perform an increasing number of tasks in connection with onchocerciasis and schistosomiasis. Medical consultations are also provided in rural areas without dispensaries, and when required transport the patients to the nearest hospital.

The mobile units (each unit comprises 3 nurses, 2 assistant nurses and a driver) can examine 250 to 350 persons per day. Special teams trained at IOTA (Bamako) provide the treatment of trachoma; a mobile serological unit can perform 150 Kline tests per day.

Medical facilities comprised (1964) about 6600 beds in hospitals and other institutions—about 1 per 550 persons. There were 4576 beds in regular government hospitals and institutions, 1465 under the Service des grandes endemies and 574 in hospitals and leprosaria of the religious missions.

The health and medical facilities include: 3 regional hospitals—the central hospital at Abidjan (294 beds), one at Treichville (787 beds) and one at Bouaké (300 beds), and 8 secondary hospitals; 51 medical posts or centers (each unit includes a dispensary, maternity clinic, pavilion for hospitalized patients, and is

under the direction of a physician; 179 dispensaries and maternity clinics; the psychiatric hospital at Bingerville (250 beds); a leprosy institute at Adzopé (300 beds); a blood transfusion center; the Institute of Hygiene; and, soon, a Pasteur Institute at Abidjan, now under construction.

Plans provide for the construction of regional hospitals of 400 beds in Korhogo, Daloa, Abengourou and Man and for secondary hospitals at seats of sub-prefectures.

The medical and paramedical personnel in government and private practice was as follows (1964):

	<u>Government service</u>	<u>Private practice</u>	<u>Total</u>
Physicians	141	39	180
Pharmacists	10	55	65
Dentists	3	2	5
Prosthodontists	5	-	5

In addition, 96 midwives, 1182 male nurses and 419 female nurses were employed by the government. The total hospital personnel includes about 3500 people. Approximately 280 nurses and 7 midwives, mostly French, were in private practice. The 180 physicians correspond to about 1 physician to 20,000 inhabitants. The number of fully qualified African physicians in government service is still very small. In 1957, the Ministry of Health employed 52 fully trained physicians (French doctor degree) out of which 5 were indigenous, while 65 Africans were medical assistants (Médecins africains). In 1964, about half of the physicians and pharmacists and all dentists in government service were French. In September 1965, a total of 73 French physicians provided by the Ministry of Cooperation were serving in Ivory Coast.

PUBLIC HEALTH PROBLEMS

The following disease problems, although similar to those of neighboring countries, are among the most important in Ivory Coast.

Malaria is the outstanding problem and infection is almost universal. Endemicity, highest in the savannah area of low altitude, is lower in the forest zone and in many coastal areas. Cases treated represent only a fraction of the total infection (57,000 cases seen by physicians in 1961). Infection with Plasmodium falciparum, by far the most important and responsible for severe forms, is present in 90 per cent of cases; P. malariae is widely distributed but accounts only for 10 to 30 per cent of positive slides. Strengthening of rural health services as a prerequisite for eradication of malaria was attempted from 1957 to 1962. Presently malaria control relies on use of drugs (pyrimethamine, primaquine, chloroquine) and disinsectization of houses in towns and villages. Studies of the conditions of use of insecticides are required in view of increasing resistance of Anopheles gambiae to dieldrin and gamma-BHC.

Onchocerciasis due to Onchocerca volvulus transmitted by S. damnosum has long been recognized as a public health problem. A survey (1950-1954) revealed among 295,000 examined about 1700 cases or 5.8 per 1000, with up to 15 cases per 1000 in some areas. The main foci seem to be located along rivers in the Korhogo area and further east along the Comoe River. Surveys were made in Ivory Coast on

the ecology of S. damnosum and its breeding areas in the Korhogo area (on the Bandama and Bagoe Rivers) and at Tiassalé (lower Bandama River). Vector control will be attempted in these two foci along the Bandama River in 1966.

Bilharziasis is a serious problem given little attention so far. The number of infected persons has been estimated by one expert (1961) at 700,000. High infection rates with S. haematobium have been recorded on the Red Bandama River and especially in the Man district. S. mansoni is known to exist in the Abidjan area.

Tuberculosis is recognized as a major public health problem but data on prevalence and mortality are not available. The campaign in rural areas is done mainly by the mobile units in collaboration with the specialized tuberculosis service; the local service does the skin tests (by means of dermajets) and the tuberculosis service checks the results and gives BCG vaccination to any person with a reaction having a diameter of less than 8 mm. A nation-wide skin test survey (300,000 persons) is in progress (1965). The second phase of the vaccination campaign will rely on indiscriminate vaccination of about 600,000 persons per year not preceded by skin tests.

Trypanosomiasis incidence, due to T. gambiense has been declining steadily and the total of new cases was as low as 1.3 per 1000 persons among 2,163,000 inhabitants seen in 1963. In 1964, the total of new cases fell from 867 to 577. However, several residual endemic foci still remain active along the boundary of Ghana. In 1964, the assistance of OCCGE was requested to deal with Abengourou-Agnibilékrou and Ayamé-Aboisso foci. A specially equipped laboratory truck has completed an electrophoretic survey of beta-2-macroglobulins (permitting detection of carriers of trypanosomes) in the Abengourou area.

Leprosy incidence is high. A total of 14,824 new cases was found in 1964 and 109,683 lepers were accounted for by the end of that year. The highest proportion of lepers was found in the north (Korhogo area) and in the central districts. Treatment is mainly with injectable sulfones and less frequently with sulfone tablets. The leprosy institute at Adzopé (300 beds) and similar treatment centers at Manikoro (150 beds), Daloa (240 beds) and at Dimbokro (100 beds) provide a total of 790 beds for lepers. There are further 430 beds in eight smaller leprosaria. The total of 1220 beds is considered as quite inadequate for 110,000 known lepers. Specialized surgeons of the Institut Marchoux in Bamako were to visit the Adzopé institute to teach rehabilitation techniques. Social rehabilitation of the cured (about 9.1 per cent in 1964) is a problem in Ivory Coast.

Yaws is still widespread and its control in the tropical rain forest zone is difficult. Over the period of five years (1958-1963) the proportion of contagious persons among those visited fell from 3.24 to 0.72 per cent. Abandoning the WHO plan (i.e., wide prospection of the population and treatment with a single injection of PAM), OCCGE adopted (1961) a selective serological prospection and a three-injection treatment with repository benzathine-penicillin (extencillin) of one-tenth of those prospected. The treatment is followed by three serological controls over a period of two years (32.2 per cent of positives among 134,000 tests in 1963).

Syphilis appears to be spreading, mainly in the savannah area (Korhogo), where yaws incidence is known to be very low.

Trachoma is an important health problem in the dry savannah region—infection

rates of 12 to 25 per cent among those examined (1963). During the first half of 1964, the mobile teams found, among 517,000 examined, 3258 cases of trachoma and also 528 cases of blindness (not necessarily due to trachoma).

Meningococcal meningitis is present, mainly near the Mali and Upper Volta boundaries, but only 23 cases (1 death) were found in 1964. The persistence of the disease in one area throughout the years would justify a special survey.

Measles is a direct and indirect cause of high mortality among children. A vaccination campaign (initiated with the assistance of U.S. AID) in 1964-1965 immunized 226,000 children from 6 months to 6 years of age in the area along the Upper Volta boundary and in the main foci (Dimbokro, Bouaflé, Oumé areas) where morbidity was known to be above 4 per cent (1964). The second part of the campaign (end 1965 - beginning 1966) is expected to cover about 200,000 children.

Smallpox reached a peak incidence in 1961 with 4651 known cases (237 deaths). A special vaccination campaign covered about 80 per cent of the population (1961-1964). The annual number of vaccinations is about 330,000, but the mobile services could perform, if required, 1 million vaccinations per year. There were only 22 cases of smallpox during 1965.

Nutritional deficiencies are the cause of much of the poor health of the Ivory Coast. Most people suffer from malnutrition resulting from traditional patterns and habits of producing and consuming food. The most serious nutritional problem is protein deficiency, which is a principal cause of the high infant mortality rate.

Research relating to nutrition of interest to the Ivory Coast is carried on at ORANA in Dakar. ORANA is studying the vitamin content of traditional African foods and is preparing new composition tables essential for nutritional surveys. In cooperation with FAO and UNICEF, ORANA is working on new protein-rich foods destined for children.

Considerable effort is made by the government in cooperation with French research institutes such as Institut de recherches sur les cultures vivrières et l'agronomie tropicale (IRAT), set up in 1964, to improve the quality of foodstuffs grown in the country and to strengthen the food processing industry. A research institute for food technology, the Institut de Technologie alimentaire, will soon be organized within the University of Abidjan.

Health education in the field of nutrition is a part of the teaching program in the schools of Ivory Coast. The volume issued by ORANA (Dupin: Our Food. A Handbook for the Use of Teachers in West Africa) in 1962 and the school manual on nutrition of the Ivory Coast (UNICEF 1963) are widely used. WHO will assist the establishment of a nutrition unit at the Public Health Institute, Abidjan (see Table 11).

HEALTH DEVELOPMENT PLANS

The national plan for public health covering the period up to 1970 provides for the development of fixed institutions (regional hospitals, rural health centers and dispensaries, a Pasteur Institute and laboratories), better distribution of hospital facilities throughout the country, development of preventive and social medical services, medical and paramedical education and health education of the

public adapted to national health problems.

While the plan provides for the strengthening of "static" institutions, it maintains the policy relating to the control of endemic diseases and preventive immunizations by means of mobile medical units. This method, which in the past gave excellent results in the control of sleeping sickness, is believed to reach a much wider share of the rural population and thus to permit the discovery of cases of endemic diseases at an earlier stage. It is further believed that with more frequent visits the mobile services could be entrusted with new tasks in the field of rural sanitation and treatment (as, for instance, weekly chemoprophylaxis of malaria).

Medical and paramedical education and health education of teachers and leaders received high priority in the development plans.

The decision to provide full medical training to their own nationals at the Abidjan School (soon to have a teaching hospital) is, no doubt, a positive contribution to the solution of the shortage problem; making a sojourn in the bush compulsory for sixth-grade medical students will at least acquaint them with the problems of rural areas.

The need for teaching of public health is fully recognized by the Ministry and a great deal is expected from the new Institute of Public Health which will house the chair of hygiene and public health of the Faculty and provide post-graduate training to physicians and special training for upper echelon administrators and to sanitary engineers. A special program in public health will be available for nurses and technicians, as well as seminars in environmental sanitation for civil servants of various government services.

* * * *

The strengthening of the Institute of Public Health, as well as the provision of a rural training zone in environmental health would be valuable contributions to the program.

Table 11

Estimated WHO Commitments in Ivory Coast, 1965-1967

<u>Project</u>	Number of Posts			Estimated Obligations		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Leprosy control	-	-	-	\$ 1,200	\$ -	\$ -
Vital and health statistics	1	1	1	16,640	16,146	17,988
Fellowships (vital and health statistics)	-	-	-	-	4,000	-
Health education	1	1	1	9,535	16,364	18,408
Maternal and child health services	2	2	2	27,511	28,921	29,912
Fellowships (maternal and child health)	-	-	-	4,000	-	-
Nutrition: Nutrition unit, Public Health Institute, Abidjan	1	1	1	9,535	16,364	18,408
Environmental sanitation	1	1	1	22,315	36,341	25,854
Fellowships	=	=	=	-	-	4,000
Total	<u>6</u>	<u>6</u>	<u>6</u>	<u>\$ 90,736</u>	<u>\$118,136</u>	<u>\$114,570</u>
Other obligations				\$185,000	\$173,000	\$202,000

VITAL AND HEALTH STATISTICS (1963-1968). To organize and establish a section of vital and health statistics in the Ministry of Public Health.

The Division of Vital and Health Statistics set up in the Ministry of Public Health, which is headed by a national medical officer, has been assisted by the WHO statistical adviser since 1963. After studying workable methods for the collection and utilization of statistical data, the adviser assisted in the preparation of information forms for use by the health centers and especially the maternity centers.

The training of personnel has the constant attention of the Government and the statistician has cooperated in the health statistics training given at the Ecole des Infirmières, Abidjan.

HEALTH EDUCATION (- 1968). To advise on and assist the establishment of a Health Education Unit in the Ministry of Health and the extension of health education methods in the health services and training programs.

MATERNAL AND CHILD HEALTH SERVICES (March 1964-1970).* To continue assistance to improve maternal and child health services as part of an over-all development of health and social services, to continue assisting the training of national personnel to staff maternal and child health centers, particularly in rural areas.

The WHO medical officer reported for duty in October 1964.

Discussions have been held with the Social Affairs Department concerning aspects of the maternal and child health program of mutual interest. A study was made of the Cocody area with a view to developing a pilot zone for training purposes. The WHO medical officer also made a study of the health facilities existing in the northern region of the country.

The public health nurse educator has given advice regarding the reorganization of the ante-natal clinic at Treichville. The objective was to provide an area where student nurses and midwives might have planned experience in the care of the ante-natal mother.

NUTRITION: Nutrition Unit, Public Health Institute, Abidjan (- 1968). To assist together with FAO, the establishment of a nutrition unit which will be responsible for the training of personnel, for nutrition surveys and for organization of nutrition programs.

ENVIRONMENTAL SANITATION (1963-1968). To assist in setting up a sanitary engineering section in the Ministry of Health; to train sanitation staff and develop a long-term sanitation program for the country.

A draft decree setting forth the responsibilities of the Central Sanitation Service was prepared and submitted to the Directorate-General of Public Health. The training program for health staff was presented in a report to the Government as well as the draft decree for the organization of a school for the professional training of sanitation staff. The decree defines the category and organization of the proposed school, the admission of students and the curricula. The Ministry of Health has given its agreement in principle to the establishment of this school which should begin at the end of 1965.

The plan to form a water committee and the laying down of its statutes are being worked out.

* This project receives UNICEF support.

SPECIAL ACCOUNTS

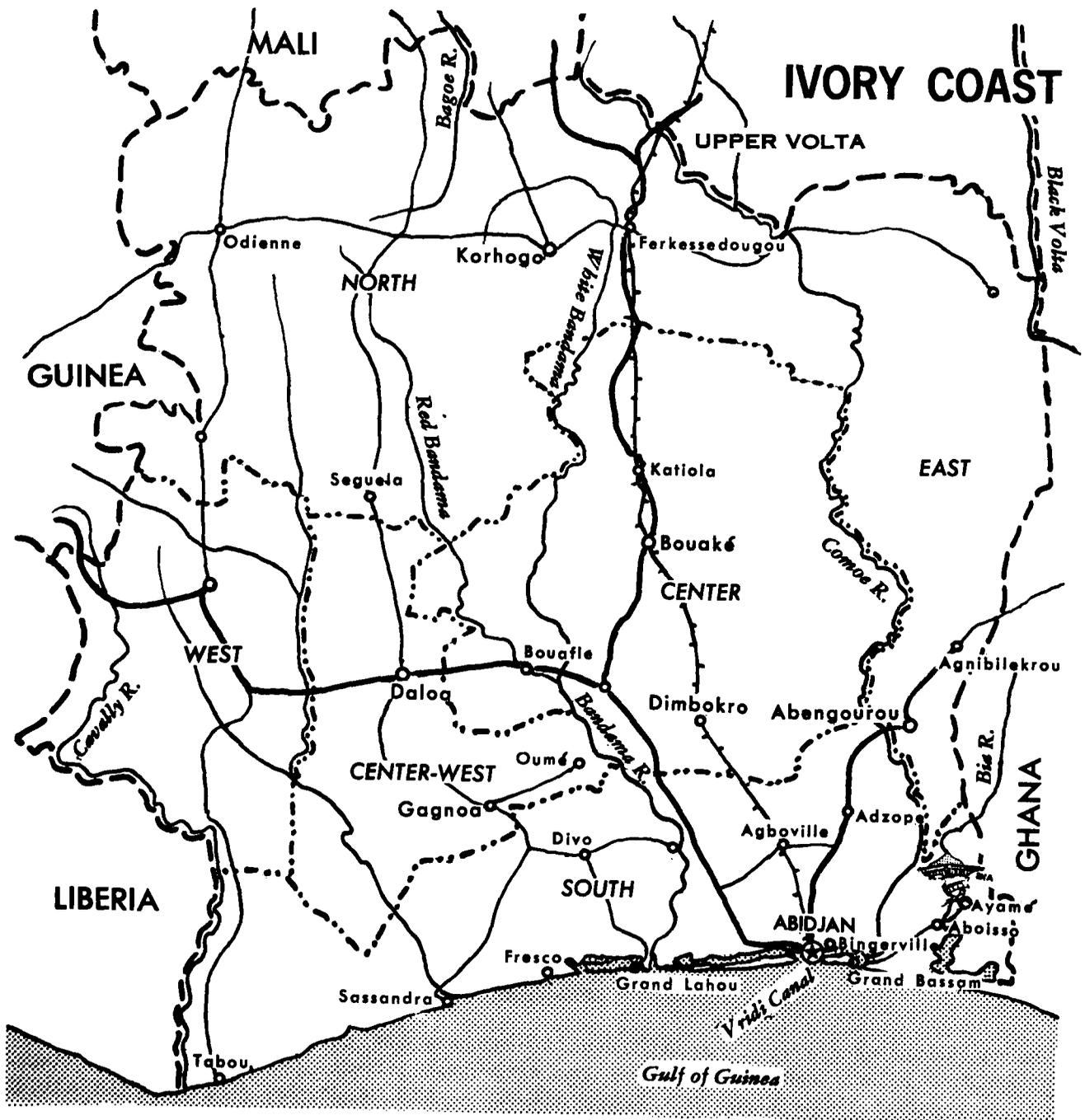
A supplement to the provision of the regular budget will be granted by the Malaria Eradication Special Account for 1967 in the amount of \$54,299 (3 posts) to develop a network of basic health services on which malaria eradication in the Ivory Coast can be built. Another supplement was allocated by the Community Water Supply Special Account for 1965 and 1966 successively \$22,000 and \$22,000.

Table 12

UNICEF-Aided Projects in Ivory Coast, 1960-1964

Total allocation: \$917,000

YAWS CONTROL	Approved 1960 \$ 115,500
UNICEF has supplied field equipment for 15 mobile units, penicillin, vehicles and campaign and laboratory equipment.	
LEPROSY CONTROL	Approved 1960 \$ 268,100
UNICEF provides drugs, vehicles and vehicle maintenance equipment.	
APPLIED NUTRITION	Approved 1961 \$ 292,000
UNICEF is providing equipment for school canteens and gardens, an audio-visual unit for mass nutrition education, horticultural and poultry-raising equipment, smoked fish and dried skim milk for school feeding, transport, stipends and fellowships. FAO provided a horticulturist, an agricultural extensionist and a nutrition expert.	
SOCIAL SERVICES	Approved 1961 \$ 156,800
UNICEF is providing teaching, audio-visual and demonstration equipment for the National School for Social Welfare Training, 28 social centers and sub-centers and for the re-education center at Debou, demonstration kits, vehicles, salaries of the director and assistant director of the school for two years, stipends. The UN is providing a social service expert, expert in pedagogical technique and an expert in production of audio-visual aid.	
UNICEF is also providing equipment for women's activities in three rural education centers and stipends to train six instructors for the <u>Associations familiales et rurales</u> . Stipends and vehicles are supplied to the <u>Jeunesse agricole catholique féminine</u> which provides basic education for village girls in homemaking and in civic and social values.	
MOTHERCRAFT AND HOMECRAFT	Approved 1961 \$ 84,500
UNICEF provided vehicles, stipends, audio-visual equipment for the National Institute of Youth and Sports, the women's clubs and the <u>Jeunesse et Travail (JET)</u> education centers.	



THE ISLAMIC REPUBLIC OF MAURITANIA

Population:	1 million	Number of doctors:	26
Area:	451,351 sq. mi.	Doctors per population:	1:40,000
Capital:	Nouakchott	Hospital beds:	530 or 1:1900

GENERAL

Geography and topography. Mauritania, the land of the maures or moors, is a largely desert region of 451,351 square miles. Lying at 5°-17° west longitude and 16°-27° north latitude, the country is bounded on the west by the Atlantic Ocean, northwest by Spanish Sahara, northeast by Algeria, east by Mali and south by Senegal. The northern two thirds of the country is mostly desert; the southern third is sahelian savannah. A narrow strip along the southern border, the Chemama or valley of the Senegal River, is the only cultivable region. Beyond this riverine area, dry savannah extends to about 18° N (roughly the line from Nouakchott in the west to Aioun-el-Atrouss and Nema in the east). Above 18° N, the land is semi-Saharan, becoming Saharan at about 20° N. Mountainous regions, such as Adrar, Tagant, Assaba and Affole, receive enough rainfall for palm groves.

The coastline is characterized by shifting sandbanks, smooth dunes, mudflats and marshes; the absence of natural harbors, the strong surf and frequent fogs and mists caused by the meeting of the cold Canary current with hot winds from the interior make navigation dangerous. However, there are fine fishing grounds in the territorial waters and a deep water port at Port-Etienne on Cape Blanco near the border with Spanish Sahara. Port-Etienne is cooled by trade winds, as to a lesser degree, is the neighborhood of Nouakchott.

Population. Nomadism and movement of herdsmen back and forth on the borders with Senegal and Mali make census-taking difficult, and some authorities believe the collected figures always err on the conservative side. The population in 1965 is estimated at 1 million. The average density for the country as a whole is estimated at 2-3 persons per square mile; however, 90 per cent of the population lives south of 18° N, and here the average density ranges between 6 per square mile in the sahel to 18-20 per square mile in the Senegal River Valley. The rate of annual increase is estimated by various sources as 1.2 to 2 per cent.

About 80 per cent of the population is Moorish (Arab-Berber descent), 20 per cent Negro. The Negro tribes—Toucouleur, Sarakolle and Ouolof principally—are sedentary farmers in the river valley. The moors are nomadic livestock raisers and date growers in the sahel and semi-Saharan regions.

The four largest urban centers are cities of about 10,000 population each: Nouakchott, the capital, Kaédi, Port-Etienne, and Atar. There are 12 cercles or districts and 31 sub-districts. The districts and their chief towns are: Adrar (Atar), Assaba (Kiffa), Baie du Levrier (Port-Etienne), Brakna (Aleg), Gorgol (Kaédi), Guidimaka (Sélibaby), Hodh occidental (Aioun-el-Atrouss), Hodh oriental (Nema), Inchiri (Akjoujt), Tagant (Tidjikda), Tiris-Zemmour (Fort-Gouraud), Trarza (Rosso). Some reorganization and decentralization is planned for the future; one proposal is to give Port-Etienne jurisdiction over the districts of Baie du Levrier and Tiris-Zemmour. An increasing number of urban communities are being made self-governing communes.

Government. Mauritania became a French colony in 1920, elected to join the French Community in 1958 and proclaimed its independence on November 28, 1960.

Mauritania's people—a nomadic Moorish majority and a sedentary Negro minority—underline the country's position as a geographic and cultural link between Saharan and sub-Saharan Africa. The government's problem is to weld the two groups into a nation. The Moors cling to their ancient Arabic, tribal culture, with strong loyalties in some cases to other Arab countries, especially Morocco. The Negro minority, though it shares the Islamic religion of the Moors, looks to Senegal, with whom it shares racial identity, trade, and an affinity for French education and culture. In the background is the ancient caste cleavage between warrior and marabout Moors and tributary or slave Negroes, though, today, about one-third of the Moors are of the Haratin class (mixture of Arab-Berber and Negro).

Compounding the government's problem in creating national cohesion is the necessity to try to create a viable modern economy with few resources and an acute shortage of trained personnel.

Creation of a single political party, Parti du Peuple or Hisb Chaab, which embraces all partisan groups and reaches all levels of the society, has been a powerful factor in developing national consensus and mobilizing the tribal groups to help build a modern economy. Another stabilizing factor was the adoption in 1961 of a strong presidential system to replace the less stable parliamentary form. Mokhtar Ould Daddah has been the party leader and president of the republic since August 20, 1961.

The most serious challenge to Mauritanian independence so far has come from without—from Morocco—who claimed Mauritania as its own, unsuccessfully attempted to block its membership in the United Nations, and for a time threatened invasion. In this connection, Ould Daddah's government in 1962 was able to dismiss a number of leaders suspected of disloyalty, including army officers, and to convict and execute several "terrorist" rebels. Most Moorish leaders who originally rallied to Morocco have returned to Mauritania and some have joined the government. In 1964 Mauritania was finally recognized by the bellwether of the Arab world, the United Arab Republic.

With the exception of Morocco, Mauritania has maintained friendly but independent relations with other countries. In 1963, a border settlement was successfully negotiated with Mali.

Mauritania is a member of the United Nations and its specialized agencies and an Associate Member of the European Economic Community; it is also a member of OAU, the West African customs and monetary unions, and the regional Comité inter-états pour l'aménagement du bassin du fleuve Senegal. Mauritania withdrew from the OCAM in July 1965, after the admission of Congo (Leopoldville).

Education. The rate of school-age children in school is between 10-12 per cent (1963). In 1964, there were 23,000 elementary school students in more than 500 classes; and 1500 secondary students in more than 20 classes. Mauritania is devoted to its Islamic heritage and to the Arabic language, and maintains an Institute of High Islamic Studies at Boutilimit, which also receives students from adjoining countries of Senegal, Mali, Guinea and Niger. Teaching of Arabic (recently made mandatory in secondary schools) is approved by the Moors and disapproved by the Negroes, who prefer French (French is the official language of

the country, but Arabic is widely spoken). An increasing number of girls are attending primary schools since independence, and there is an increase in tent schools for nomads. In 1964 some 142 students were in secondary schools and universities abroad, 34 in French institutions, 55 at the University of Dakar and the remainder at universities and secondary schools in Cairo, Abidjan, Tunis and Moscow. Six of the students at Dakar are studying medicine.

There are seven secondary schools (lycées and colleges)—at Nouakchott, Rosso, Atar, Aioun-el-Atrouss, Boghé and Kaédi. Three special schools set up in connection with the development program are: Centre national de formation administrative (the first unit of a planned National School of Administration) at Nouakchott (1964) for training of government workers; Ecole des assistants d'élevage, at Kaédi (1964) which has a two-year course and a first class of 10 veterinary assistants; Ecole d'Agriculture also at Kaédi (1965) which will train 25 monitors a year. A government-sponsored Vocational Training Center is operated at Port-Etienne.

Sixty-one French technical assistance personnel were working in education in Mauritania in December 1964; the United Arab Republic and Tunisia also supply some technical assistance personnel for Mauritania's Arab education program.

Mauritanian teachers, who formerly trained in Senegal, now train at the Institut Pédagogique (Nouakchott) founded in 1960. Nutrition education has been added to the curricula.

In 1963, the national education budget was \$3.241 million or 17 per cent of central government operating costs.

ECONOMIC RESOURCES

The gross national product is estimated at \$98 million per annum, with a per capita income of \$111. The four-year interim development plan (1963-1966) called for an investment of \$112.4 million, of which the health sector was to receive 2.8 per cent or about \$3.149 million. General studies and planning was to receive 5.7 per cent; infrastructure (transportation and communication) 12.9 per cent; rural production 8.6 per cent; mineral production 33.8 per cent; fishing industry 6.9 per cent; commerce 4.6 per cent; training, teaching and information 3.3 per cent; municipal constructions and housing 14.5 per cent; administrative and government buildings 7.7 per cent.

With the exception of some facilities for smoking and drying fish at Port-Etienne, Mauritania had no industry at the beginning of independence. In the subsistence economy the nomads raised livestock and dates and sedentary Negro farmers raised millet and other fast-growing crops along the Senegal River. Today, development of iron and copper resources, together with technical assistance from France and other sources, is giving the country the opportunity to develop a self-sustaining economy.

A West European consortium and the World Bank have invested about \$200 million in developing iron mines near Fort-Gouraud, a 420-mile railroad connecting the mines with Port-Etienne and modern loading and storage facilities at the port. A branch line of the railroad is also being constructed to Akjoujt, where a Canadian-American company is beginning to mine copper. Royalties and revenues from the mining operations, when full production is reached in the late 1960's, are expected to provide more than a third of the government's anticipated income,

or about \$10 million annually. Tungsten is also found in Mauritania and the search continues for other minerals, notably petroleum.

A new trading agreement with Spain and modernization of fish processing plants at Port-Etienne—a new fishing wharf, freezing plants, and other facilities financed by FAC and FED—are expected to create a \$12 million a year fishing industry.

Rainfall is sparse and there are long cycles of drought. The current drought in its fourth year caused nomads to begin selling their most useful possessions, their camels. Water must come from wells, from the river or from the sea. Desalinization of sea water began at Port-Etienne before independence, and the demands for more water for mining and other industrial operations, as well as for livestock and grain crops, have stimulated the desalinization program. With help from FED, a new and larger plant has been built at Port-Etienne. Another new plant is being built on the coast near Nouakchott to supply the capital; a new wharf is also being built there which will permit goods to move via Nouakchott instead of through Senegalese ports. (The central government of the new republic required the building of a new city (Nouakchott) to be the capital of the country; until independence the capital lay outside the country, at St. Louis, Senegal.

A program of well-digging and erection of simple barrages to provide more water for irrigation and for livestock is under way, with help from FED. (In addition to drought, crops in Mauritania are menaced by great flocks of *Quelea* birds and by locusts; more than two-thirds of the budget of the Agricultural Service goes to fight these pests.) As more land becomes available under the redevelopment program, new crops—cotton and rice—are being introduced. An extensive program for the rejuvenation and increase of date palm groves has been launched, with FED aid. Programs to improve both quality and quantity of the poor Mauritanian cattle are being undertaken, and a system of modern abattoirs and freezing plants for meat is planned. The first refrigerated abattoir, financed by FAC, is operating by Kaédi.

There is a thriving river transportation system on the Senegal, as well as fresh-water fishing. If financing is secured for the old French plan for controlling the Senegal—or some comparable control project—Mauritania will benefit greatly through improved facilities for irrigation and river transport.

New roads are being constructed—the principal current project is the 120-mile paved highway from Nouakchott to Rosso, the agricultural collection center and the country's main contact point with Senegal.

In 1963, imports were estimated at \$32 million, exports at \$15 million. The great imbalance reflects the fact that equipment for mining and road construction and other heavy material is still being imported while full production and export of ores has yet to be achieved. Principal exports besides minerals are livestock and dates. The major supplier is France (57 per cent), but in 1963 the United States had 15 per cent of imports (chiefly heavy machinery).

The new enterprises have stimulated demands for skilled labor. The Mauritanian government has created an Office of Manpower and a Vocational Training Center at Port-Etienne to train workers for mining, fishing, construction and other projects.

At the beginning of 1965, Mauritians comprised two-thirds of the 18,500 cash wage- or salary-earners, of whom 11,500 were in private industry, 7000 in the public sector, excluding military personnel. However, Mauritians held only 3 per cent of the managerial positions and 30 per cent of skilled jobs, but 97 per cent of unskilled jobs.

NATIONAL BUDGET

Budgetary data, including the health budget and its relation to the central government operating budget (in amounts and in percentages) and estimated health expenditures per capita are set forth below.

(in thousands)

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$13,983	\$13,876	\$ -	-	\$ -
1962	16,524	15,754	-	-	-
1963	21,795	19,044	1,621	8.5	1.65
1964	20,389	16,337	1,309**	8.5	1.31
1965	17,626	15,194	1,291**	8.5	1.29

* Based on population estimate of 1 million in 1964.

** Estimate, based on the assumption that the health budget accounts for 8.5 per cent of the total operating budget as in 1963.

ASSISTANCE PROGRAMS

Such details as have been published on multilateral and bilateral aid programs are recorded below. Less has been published about aid to Mauritania than is the case with most other countries of this study. Therefore it may be useful to note that plans for financing the four-year interim development program called for public financing of about \$55 million or 48.9 per cent of the total of \$112.4 million. Public financing from foreign sources was estimated as follows: FED, \$26.5 million, or about 23.5 per cent of the total cost of the plan; FAC, \$13.8 million or 12 per cent; U. S., West Germany and the United Nations, \$3.3 million or about 3 per cent; others \$1.4 million or 1.2 per cent.

Bilateral. French investment in health activities through FAC from 1959 to February 25, 1964 totalled \$106,000 or less than 1 per cent of the nearly \$14 million supplied by FAC from 1960 through 1963. Of this health aid, \$85,000 was for construction of dispensaries and \$20,000 for medical supplies. In 1965, FAC supplied \$500,000 for the establishment of four new health centers and the purchase of a plane for evacuation of patients needing surgery to Nouakchott.

More than 200 French technical assistance personnel serve in Mauritania; in 1964, 28 were in the health services.

American assistance in technical cooperation/development grants through U.S. AID amounted to \$147,000 (FY 63), \$153,000 (FY 64) and \$46,000 (FY 65). Of these amounts, health and sanitation project allocations amounted to \$100,000 in FY 63 and \$83,000 in FY 64. It is believed that the FY 64* allocation covered the cost of 27 mobile treatment vehicles, ambulances and trucks; U.S. AID has also assisted in the development of Mauritania's new maternal and child health pilot center.

Donations of U.S. surplus agriculture commodities for use in Mauritania in recent years totalled \$711,000 through FY 65. (Mauritania is normally almost self-sufficient in food, but has suffered a persistent drought in the 1960's.)

The Federal Republic of Germany has financed construction of a national radio station of 100 kw (1965), and furnished consulting engineering services in water development and transportation. In 1963 Mauritania received the equivalent of \$1.1 million under the program of fellowships and training sponsored by West Germany for nationals of developing countries.

In 1964-1965 Spain sent missions to study possibilities for technical assistance in the building of a cement plant and in improving the electrification program.

Yugoslavia has supplied planners and technicians for the projected chain of cold storage plants.

A study mission of Russian experts spent six weeks in Mauritania in late 1964 to consider technical cooperation in agriculture, fishing, mining and training, but it is not known what subsequent action was taken.

Mauritania has an agreement with UAR (1961) for personnel assistance in teaching, information, health and labor matters; and technical cooperation agreements with Tunisia (1964) and Algeria (1965).

Mauritania recognized the People's Republic of China in 1965 and also has diplomatic relations with North Korea, North Vietnam, Rumania, Hungary and Czechoslovakia, but no aid projects from these countries have been announced.

Multilateral. From 1958 to June 30, 1964, FED health credits totalled \$2.9 million. Of this amount, \$2.2 million was for health projects; \$693,000 for sanitation projects. The bulk of the health funds (\$2.009 million) was for the Nouakchott hospital, its school for hospital attendants, and 10 living quarters for staff; the remaining amount (\$203,000) was for the central pharmacy at Nouakchott. The sanitation projects (\$693,000) were for construction of 50 new village wells. Other FED projects include \$4 million—desalinization of sea water, Port-Etienne; \$4 million for new fish wharf and freezing plant, Port-Etienne; \$8.2 million, highway construction; \$1.5 million, school construction; \$1 million wharf for Nouakchott. FED also contributes to the program of barrage and well construction and to the program to improve the palm groves.

In 1965, the World Bank through IDA approved a \$6.7 million loan for highway construction (Nouakchott-Rosso road).

* From AID Operations Report, FY 64; compare with Appendix 1, Volume I.

The United Nations Expanded Program of Technical Assistance in 1964 totalled \$150,192, covering the services of 6 experts (\$42,752) and 43 fellowships (\$102,846), in which the WHO share (\$57,895) covered 14 fellowships in nurse training and 8 in nursing education; FAO (\$16,119) 2 experts in fisheries development and 1 in nutrition; UNESCO (\$40,435) 1 librarian and 9 fellowships in social science, science studies and teacher training, and some equipment and supplies; ILO (\$32,697) 2 social security experts and 14 fellowships in manpower organization, vocational training and business administration.

The WHO assistance program in 1965 provided for the services of 8 technical advisers, of whom 5 were concerned with the malaria pre-eradication program, 1 nursing adviser and 2 maternal and child health experts. The regular budget obligations for 1965 were about \$107,000, in addition to \$120,000 from extra-budgetary funds (see Table 13).

UNICEF has provided funds for projects relating to maternal and child health, leprosy control and applied nutrition (see Table 14).

ORGANIZATION OF HEALTH SERVICES

The public health service (Direction de la Santé publique) is one of the two directorates of the Ministry of Health, Labor and Social Affairs (Ministère de la Santé, Travail et Affaires Sociales). The maternal and child health service is a part of the directorate of medico-social affairs (Direction des Affaires medico-sociales).

The static service includes the new National Hospital (235 beds) at Nouakchott, completed in 1965; 3 secondary hospitals (total of 150 beds) located at Atar, Kaédi, and Aioun-el-Atrouss; 8 maternal and child health centers (total of 50 beds) located at Aioun-el-Atrouss, Atar, Boghé, Kaédi, Nema, Port-Etienne, Rosso and Sélibaby; 15 medical centers and 15 maternity clinics (about 100 beds); 50 rural dispensaries; and a central provisioning pharmacy at Nouakchott.

The mobile service consists of one sector for the control of endemic diseases with headquarters at Kaédi, and four equipes nomades based at Aioun-el-Atrouss, Nema, Rosso and Tidjikja.

A modern polyclinic exists at Cansado, the new town built on the Baie du Levrier for iron mine workers, and it is likely that modern medical service is also maintained at the copper mine complex near Akjoujt. (However, these medical facilities and staffs are probably private and foreign, imported and maintained by the Europeans and Americans who operate the enterprises.)

No recent statistics on medical and paramedical personnel are available. The figures reported by WHO (1962) list 24 government and 2 private doctors; 133 certificated government nurses and 4 certificated government midwives. In 1964, 28 French technical assistance personnel were reported serving in health. On the basis of 26 doctors, the doctor/population ratio is 1:40,000. Bed/population ratio is believed to be about 1:1900, based on 530 beds for a population of 1 million.

The School of Nursing or Ecole de la Santé publique, an adjunct of the new National Hospital, is equipped to train 30 national nurses, 5 midwives and 10 nurses of diplôme d'état level per course.

PUBLIC HEALTH PROBLEMS

Endemic syphilis was very prevalent among the nomadic tribes, but has been reduced in importance by mass penicillin campaigns. Bilharziasis is said to occur wherever there is surface water; the infection rate is high in the southwestern part of the country, reaching in one area the bulk of the population; the officer in charge of the endemic diseases service in 1961 spoke very pessimistically about prospects for its control, which is not being attempted. Malaria is still a problem in Mauritania as can be seen from the malaria pre-eradication program (Table 13). About 20,000 cases (with 44 deaths) were recorded in 1961. There are approximately 7000 lepers, who tend to dodge back and forth across the frontier of the Senegal River and so avoid control. At the end of 1964, about 1900 cases were registered, of which 38 per cent were treated regularly. Mauritania participates in the regional measles control campaign sponsored by U.S. AID and will receive 39,000 units of the vaccine for the 1965-1966 program.

HEALTH DEVELOPMENT PLANS

A comprehensive plan for development of the health services will be a part of the Social and Economic Development Plan to be announced in 1966.

The four-year plan (1963-1966) included provision for the building of the National Hospital and the creation of the Ecole de la Santé publique at Nouakchott, the modernization of the three regional hospitals at Atar, Kaédi, and Aioun-el-Atrouss, organization of a network of static health centers and a system of evacuation of patients for short distances and enlargement of the mobile services.

Health education and coordination of nutrition and social welfare activities are an essential part of the plan, which is regarded as a first stage in the development of a broader long-term public health scheme, subject to the availability of resources.

From the evidence of FAC and U.S. AID assistance allocations it would appear that the following improvements for this program have been achieved: 4 new health centers, an airplane for the evacuation of patients requiring surgery (FAC 1965) and 27 new vehicles added to the mobile service (U.S. AID 1964).

4
* * * *

The development of the iron ore near Fort-Gouraud, promising considerable improvement of Mauritania's economic position, has already brought to the remote north new wealth, new standards of nutrition and some medical care.

Much hope is placed in the Senegal basin development scheme now under study by the Inter-state Senegal River Committee (assisted by UN Special Fund). For Mauritania, the scheme holds promise of a considerable increase in agricultural production and the hope of providing the sedentary Negro areas with an income comparable to that in the mineral areas of the Moorish north.

Meanwhile Mauritania has to husband carefully its financial resources and to concentrate on training technical personnel and administrators. In the field of public health, further assistance is needed for accelerating the training of auxiliary health workers, the development of static health centers and training teachers for health education and nutrition tasks.

Table 13

Estimated WHO Commitments in Mauritania, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	5	4	4	\$ 76,476	\$ 61,812	\$ 65,593
Leprosy control	-	-	-	1,200	-	-
Nursing advisory services	1	1	1	4,897	13,153	15,112
Maternal and child health	2	2	2	24,213	26,120	27,247
Fellowships	=	=	=	-	18,000	20,000
Total	<u>8</u>	<u>7</u>	<u>7</u>	<u>\$106,786</u>	<u>\$119,085</u>	<u>\$127,952</u>
Other obligations				\$120,000	\$130,000	\$129,000

MALARIA PRE-ERADICATION PROGRAM (1962-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Mauritania can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

The preliminary survey for the collection of epidemiological base line data was extended to the provinces of Inchiri, Trarza, Brakna, Tangant and that part of the district of Adrar south of the desert, where several oases were visited to complete the data collected in the previous year.

Epidemiological assessment continued to be carried out to complete the collection of base line data also in the south in the districts of Hodh (western and eastern), Gorgol and Guidimaka.

A study on the incidence of malaria in the infants age group is being carried out through the maternal and child health centers in Kaedi. Training of personnel assigned to the malaria service continued its normal course and up-to-date five microscopists completed their training, four entomologists are undergoing a practical field training and good results are expected.

Special refresher courses in malaria microscopy have been organized for laboratory technicians of the health centers, and reorientation and retraining of technical and auxiliary personnel of health posts has started.

Plans for the development of the health network are not very far advanced for various reasons. The inventory of existing health facilities in the area of Gorgol has been finished. In conjunction with the preparation of the inventory, investigations are being made with a view to setting up public health activities in the region of Rosso, which appears to offer better accessibility than Kaedi. The training of staff and efforts to find the best and most economical administration methods is proceeding.

The progress of the project is slowed down because of local budgetary restrictions.

NURSING ADVISORY SERVICES (1963-1968).* To assist with the establishment and development of the program for the basic school of nursing and in the organization of nursing services.

Before her departure, in August 1964, the WHO nurse educator assisted with planning for the future school, and drew up lists of material and equipment which will be required. A draft plan was formulated for the program leading to the Diplôme d'Etat. UNICEF will contribute books and materials for teaching. When the proposed date for the opening of the school of nursing is known, a WHO nurse educator will again be provided.

MATERNAL AND CHILD HEALTH (1963-1967).* To continue assistance in organizing maternal and child health services and to train auxiliary personnel.

Efforts to improve training facilities and existing health services continued.

A survey of nomadic groups was carried out.

The program was reinforced by the arrival of two assistantes sociales provided by the French Technical Cooperation Department.

The WHO public health nurse educator has continued to be actively associated with the theoretical and practical teaching of auxiliary medico-social personnel during the year. Every effort was made to relate theory and practice, with particular reference to the protection of mothers and children. The 13-month course was completed in February and 11 students were then taken on a week's visit to Dakar where they observed certain health services.

It had been anticipated that this might be the last course of its kind but the delay in the opening of the proposed new school of nursing in Nouakchott may necessitate another promotion of the auxiliary class.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular budget was allocated by MESA for the years 1965 to 1967 successively \$2500, \$5500 and \$6000.

* This project receives UNICEF assistance.

Table 14

UNICEF-Aided Projects in Mauritania, 1960-1964

Total allocation: \$363,000

MATERNAL AND CHILD HEALTH (MCH)	Approved 1961
	\$ 141,300
	Additional commitment 129,000

To upgrade existing MCH centers, UNICEF is providing equipment for training, vehicles, and stipends and salaries of a midwife and nurse-tutors. WHO is providing two training experts and fellowships for nurse-tutors.

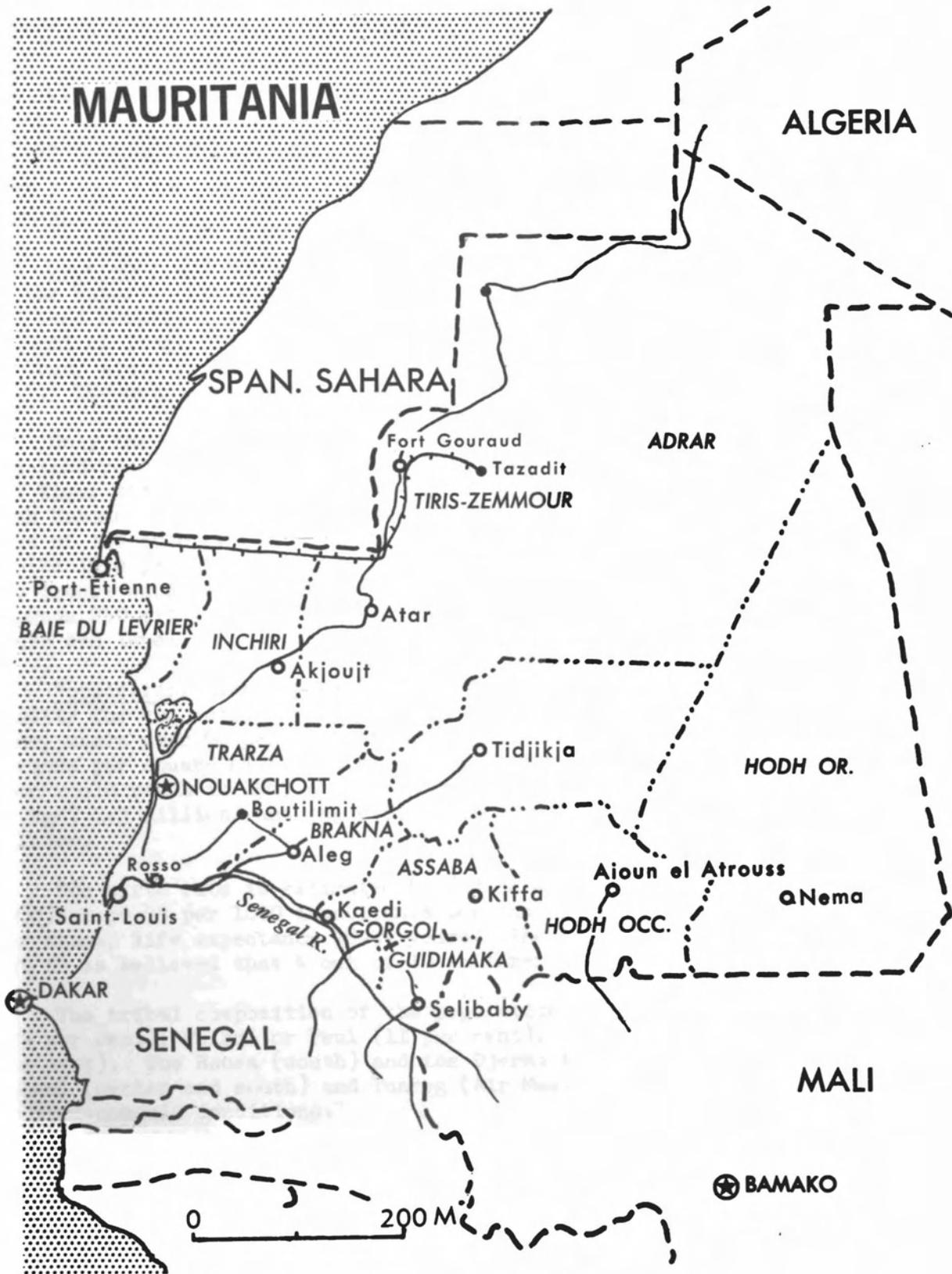
LEPROSY CONTROL	Approved 1960
	\$ 48,000

UNICEF is providing funds to cover travel costs for six team leaders and nurses specialized in leprosy in order to extend the campaign eastwards to the Mali frontier.

APPLIED NUTRITION	Approved 1962
	\$ 173,400

Following surveys by nutrition experts of FAO, WHO and ORANA* an applied nutrition project was begun with the instruction of school children and nutrition education in teacher-training schools. UNICEF is providing equipment for school canteens and gardens and audio-visual aids for teacher-training schools. FAO provided the technical staff.

* Office de Recherches sur l'Alimentation et la Nutrition en Afrique.



MAURITANIA

ALGERIA

SPAN. SAHARA

ADRAR

Fort Gouraud
Tazadit
TIRIS-ZEMMOUR

Port-Etienne
BAIE DU LEVRIER

INCHIRI

Atar

Akjoujt

TRARZA

Tidjikja

HODH OR.

NOUAKCHOTT

Boutilimit

BRAKNA

Aleg

ASSABA

Kiffa

Aioun el Atrouss

Nema

Saint-Louis

Rosso

Senegal R.

Kaedi

GORGOL

HODH OCC.

GUIDIMAKA

Selibaby

DAKAR

SENEGAL

MALI

BAMAKO

0 200 M

REPUBLIC OF NIGER

Population:	3.3 million	Number of doctors:	50
Area:	490,000 sq. mi.	Doctors per population:	1:66,000
Capital:	Niamey	Hospital beds:	1800 (total) or 1:1834

GENERAL

Geography and topography. The Republic of Niger is essentially a borderland of the Sahara. Lying between 12° and 23° N latitude and 0° and 16° E longitude, the land comprises an immense plateau of 490,000 square miles, 650 miles wide by 1000 miles long. It is bounded on the northwest by Algeria, north by Libya, east by Chad, south by Nigeria and Dahomey, southwest by Upper Volta, and northwest by Mali. The mean elevation is about 1200 feet.

Only the southern and southwestern borders (about 47,000 sq. mi.) have water and land resources that will support permanent cultivation. This region comprises the Niger River Valley bordering Upper Volta and a narrow strip along the borders with Dahomey and Nigeria on the south up to and including Lake Chad. The central part of the country (30 per cent of the land) is poor sahelian savannah. North of the 16th parallel (roughly 60 per cent of the country) the plateau is Saharan. The desert sands are broken at 18° N by a mountainous area, the Air Massif, which extends 250 miles north to south and 150 miles east to west and is 3500-5000 feet above sea level.

Population. The population in 1965 is estimated at 3.3 million. Average density for the entire country is 6-7 persons per square mile. In the farming zone, where over 90 per cent of the population lives, the average density is 24 persons per square mile. At an annual increase rate of 2.4 per cent, the population would reach in 1985 about 5.38 million, the school-age population (6-14 years of age) 1.3 million, and the active male population (15-59 years of age) 1.35 million.

The birth rate is estimated (based on a sample survey of the population of 1960) at 50-55 per 1000 inhabitants per annum; general mortality 25-30 per 1000 per annum; life expectancy 38-39 years. The infant mortality rate is not known, but it is believed that 4 out of 10 children die by the age of five.

The tribal composition of the population is: Hausa (54 per cent), Djerma (25 per cent), Fulani or Peul (11 per cent), Tuareg (3 per cent) and others (9 per cent). The Hausa (south) and the Djerma (southwest) are sedentary farmers; Fulani (center and south) and Tuareg (Air Massif) raise livestock under nomadic or semi-nomadic conditions.

Principal urban centers are Niamey, the national capital, on the east bank of the Niger River (45,000 population) and Zinder, the economic center (25,000). Smaller centers are Maradi (15,000), Tahoua (13,000), Magaria (5000) and Agadez, the Tuareg center in Air Massif (5000).

Government. Niger was established as a colony of French West Africa in 1922, became an overseas territory in 1946, and an independent republic in 1960 (August 3). After the 1958 election in which Niger chose to become a republic in the French

Community, Hamani Diori became head of the provisional government, and was confirmed as President of the Republic on November 11, 1960.

Niger was a founding member of the Conseil de l'Entente (see page 24). It is a member of the United Nations and its specialized agencies and an associate member of the European Economic Community; it is also a member of OAU, OCAM and the West African customs and monetary unions. Niamey is the site of the Commission du Fleuve Niger, an intergovernmental organization for development of the river (see page 25).

Recently, Niger has been reorganized administratively into 7 departements (each under a prefet) and 32 arrondissements (each directed by a sous-prefet). The departements are: Niamey, Dosso, Tahoua, Maradi, Zinder, Diffa, and Agadez.

Great challenges to the achievement of political stability and national unity are posed by the country's vastness and isolation, its limited natural resources, lack of transportation facilities, divergent modes of life of its people—nomad and farmer—and their different languages, religions, and tribal cultures. These challenges were underlined by the political troubles which attended the coming of national independence, when the revolutionary Sawaba party was banned and Mau-Mau type raids, launched by exiled Sawabans on Nigerien border settlements, had to be put down. Relations with Mali are still somewhat complicated by the fact that it has harbored exiled Sawaba leaders. Relations with Niger's fellow member of the Entente, Dahomey, are improving, although Niger still holds the disputed Isle of Lété in the Niger River and has not paid indemnities to dispossessed Dahomeans.

Closer relations are being established with Nigeria. The border between Niger and Nigeria divides the Hausa people. Accustomed to regard Kano, Sokoto, and Katsina as their spiritual, tribal and trading centers, the Hausa and Fulani tribesmen have been slow to patronize government customs posts. A great deal of the trade on this border is contraband. Also, Nigerian Hausa are alleged to cross the border to get free medical aid from the services of Niger. Committees from the two countries are now working out a combined health services agreement, and a number of measures are being undertaken jointly to solve common problems of human and animal disease epidemics, to curb contraband traffic, and to improve transportation routes, water supplies, and other facilities for herds and herds-men on the long trek to markets in Nigeria.

Education. In recent years, Niger averaged 11.5 per cent of its national and local budgets for education; in 1964, education costs were 14 per cent of central government operating expenses. Over half the education budget is spent for personnel.

It is estimated that 5 per cent of the population is literate. One factor which adversely affects development of education is the nomadic life (over 20 per cent of the population) which keeps children from attending schools. Another factor is that mission schools, which contributed much to education in the partly christianized states, did not develop in this Moslem country.

By 1974 it is planned to have 30 per cent of the school-age population in school. School enrollments are increasing—from 4 per cent in 1958 to 8 per cent in 1964 in primary schools nationwide (the rate varies from 16 per cent in Niamey to 2 per cent in some nomadic areas). The rate in secondary schools in 1963-1964

was about 5 per cent but this represents a ten-fold increase over 1951 and a 1.5 increase over 1961. There are some 475-500 primary schools with more than 50,000 pupils; 15 secondary schools with 2250 pupils; and 2 technical schools with 100 pupils. In 1964, 117 students attended superior schools and universities—29 in Africa, 84 in France and other European countries, and 4 in the United States.

Under the development plan an accelerated program in school building and teacher training has begun. It features low-cost elementary schools—straw huts in villages and tents for the nomads. Teachers are young instructors who have had accelerated courses in education.

Adult education classes are held in literacy, child care, home economics and food production. These classes are held for five months a year, and teachers are assisted by nurses and extension workers. In 1963-1964, the program covered 100 villages and 8000 adults; in 1964-1965, an additional 100 villages were to be added.

There are 178 French teachers and administrators in education under the technical assistance program, and some French Volontaires du Progres and American Peace Corpsmen. There is nevertheless an acute teacher shortage both in quantity and quality, and the government has initiated a crash program of refresher training for primary school teachers. In this program, mobile teams of specially trained instructors visit the teachers at their schools; 7 teams in 1963-1964 retrained 140 teachers. To reinforce the mobile teams, four regional refresher training centers were established at Niamey, Zinder, Maradi and Tahoua in 1964; each will train 40 teachers in two four-month courses per year. UNICEF and UNESCO supply expert personnel, equipment, and 160 stipends for teacher trainees in this program; other supplies come from France, the Federal Republic of Germany, and the United States. The Nigerian Government furnishes educational pamphlets printed in Hausa.

Another device to help meet the teacher shortage is educational television, which was to begin in 1965-1966, with a station which will cover Niamey and 20 villages nearby. In 1966-1967, the network will be extended to cover the Maradi region. Construction and operation of the project in the first years is financed by FAC.

ECONOMIC RESOURCES

The economy is based on subsistence agriculture and livestock raising. American sources estimate the GNP in recent years at from \$160 million to \$238 million with per capita income of \$50 to \$75. The Nigeriens themselves estimate a GNP of \$209-\$219 million (depending upon whether real value or price-supported market value is used) with per capita income of \$65 for a population of 3.3 million. Between 55 and 65 per cent of the product is consumed at the source and does not reach the markets.

The harsh climate, marked by sparse rains that are erratic both in amount and time of onset and wide daily and seasonal ranges of temperature, makes both crop farming and livestock raising hazardous. Drought can wipe out a season's harvest and kill or debilitate herds. Average rainfall in the farming zone ranges from 21 inches at the southern border to 14 inches at its northern limit (Tahoua). The Air Massif receives only 7 inches, but the altitude, which modifies the extreme heat, and the topography of the rocky soil combine to conserve enough water

for grazing lands. With the exception of the Air Massif, the limit of the cattle raising zone is 15° N. Extension of livestock raising as of other production depends upon improvement of water supplies. In the Air Massif, water is found at 15-20 feet; elsewhere, except for land adjacent to the rivers, the table is 100-250 feet down.

Chief food crops are millet, sorghum, manioc, beans, rice and garden vegetables. Industrial crops are peanuts, cotton and sugar cane. Livestock is estimated at about 10 million head, including 3.5 million cattle and 6.8 million sheep and goats. Crops are valued at about one-third of the total agricultural product, livestock at two-thirds. Fish are found in the Niger River and in the Komadougou and Lake Chad; production is about 6000 tons per year, of which 5000 tons are smoked or dried for export.

Industry constitutes about 4 per cent of the GNP and is limited to processing of agricultural products—cotton gins, mills for peanut oil, rice and flour, breweries and a refrigerated abattoir. Projects in course of completion under the development plan are a cement plant at Malbaza near Birni-N'Konni, a textile complex and tannery at Maradi, and a soap-making plant.

Urban housing programs, financed by FAC, have been launched in the towns. Plans drawn up by local collectives are subject to the approval of the national Commission d'Urbanisme. At the end of 1963, 21 of the 31 chief towns had such a program.

Power is supplied by three central diesel plants at Niamey, Zinder and Maradi with a total output (in 1963) of 13.7 million kwh. FED has studied a site on the Niger near Niamey for a hydroelectric plant to be completed by 1970 and FAC has provided funds for a study of hydroelectric sites on the Meckrou (which forms the boundary with Dahomey) and the Tapoa on the right bank of the Niger, south of Niamey.

No important mineral deposits have been found in Niger. Tungsten and tin (80 tons of tin of 70 per cent grade in 1963) are mined in the Air Massif. Salt is produced locally and some gum is gathered.

Imports in 1963 totalled \$24.2 million, mostly manufactured goods and heavy equipment from France; exports for the same period were \$21.6 million, principal markets being France (grain), Nigeria and Ghana (livestock). Livestock and its by-products are about 54 per cent of exports, grains 39 per cent. Peanuts are about 85 per cent of grain exports.

Transportation costs are serious handicaps to trade in this immense, landlocked country. Goods must be transported hundreds of miles by truck to railheads at Parakou, Kano or Ouagadougou, then by rail to Cotonou or Lagos or Abidjan for export abroad. Highways to the Dahomey and Nigerian borders are being improved, but the project to extend the Dahomey railroad to Dosso in Niger has not been approved, although it was formally presented to the EEC in 1963. A dam under construction at Kainji, above Jebba (Northern Nigeria) is due to be completed in 1968. In conjunction with other works (to bypass rapids), this will make the river navigable from the sea to within the borders of the landlocked Niger Republic, for the first time.

NATIONAL BUDGET

Budgetary data for Niger, including the health budget and its relation to the operating budget, in amounts and in percentages, for the period 1961-1965 are set forth below. Estimated health expenditures per capita are included.

(in thousands)

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs per capita*
1961	\$	\$20,989	\$2,091	9.96	\$0.70
1962 ^a	21,406	20,474	1,710	8.35	0.57
1963 ^b	29,801	28,112	2,423	8.61	0.78
1964 ^b	28,212	24,481	2,306	9.41	0.72
1965 ^b	27,609	25,924	2,256	8.70	0.68

*Based on estimated populations of 3.0 million (1961 and 1962); 3.1 million (1963), 3.2 million (1964) and 3.3 million (1965).

^aLater reduced by 25 per cent as covering 9 months only.

^bFiscal years—October 1 to September 30.

Source: Perspective décennales de développement des services de santé, Ministère de la Santé Publique, République du Niger, Niamey, 1964.

It should be pointed out that some reports of the budgets for 1961-1965 consulted in connection with this study are consistently higher than the figures shown in the above table (which are estimates projected by the Nigerien Ministry of Health). For example, in 1963 the actual health expenditure according to one source was \$2.8 million or nearly 10 per cent of a central government operating budget of \$28.8 million and a per capita expenditure for health of \$0.90.

The average annual health budget over the five-year period was \$2.157 million—or 9 per cent of the average annual operating budget. Average per capita expenditure for health over the five years was \$0.69.

ASSISTANCE PROGRAMS

Bilateral. French investment in the field of health through the FAC from 1959 to February 25, 1964 amounted to \$1.1 million or about 20 per cent of the total FAC investment in Niger during that period. This assistance included medical equipment for Niamey Hospital (\$162,400), study for extension of the hospital at Zinder (\$20,300), rural medical equipment (\$466,900), equipment for the mobile health service (\$263,900) and campaign against endemic diseases (\$162,400).

The U.S. AID program in FY 63 totalled \$748,000 in technical cooperation/development grants, of which \$100,000 was for health and sanitation projects. In FY 64, the program totalled \$2.3 million, of which \$1.8 million was a development loan for the building of John Kennedy Bridge over the Niger at Niamey; the remaining \$500,000 in grants was devoted mainly to food and agricultural projects

and transportation. In FY 65, the U.S. AID commitment was \$1.184 million, of which \$343,000 was for food and agriculture; \$462,000 for transportation.

U.S. aid for health projects was merged in the health program jointly financed by Niger, the U.S. and European sources. It included in 1964 the continuous operation of two mobile public health teams which were able to give medical examinations to 107,000 persons. It also included a measles prevention program similar to that carried out in Upper Volta.

The U.S. Peace Corps has operated in Niger since 1962. A representative group of 41 arrived in September 1964 to serve for two years in 15 centers of the country performing local tasks of public health, education and rural economy. One was a pediatrician, serving in Niamey.

In June 1964, the Federal Republic of Germany made a loan of \$3 million, of which one-half was devoted to well-drilling programs, the remainder for a tannery and meat plant and loans to small businesses through the Banque de Développement de la République du Niger.

Multilateral. From 1958 to June 30, 1964, FED credits totalled \$24.7 million for six projects. Of this amount, \$101,000 was devoted to a technical study of Niamey Hospital. Major expenditures under the FED program were for highway construction (\$11.5 million), school buildings and equipment (\$5 million), and waterworks, couloirs, and other improvements under the livestock program (\$4.5 million).

In 1965, FED approved a credit of almost \$3.3 million to cover the basic priorities of Niger's new health program.

The United Nations Technical Assistance Program for 1964 totalled \$350,412. Of this, \$254,709 was for personnel, \$71,032 for fellowships, and \$24,671 for equipment and supplies. Under this program, 21 fellowship grants were awarded to nationals and 27 experts and technicians employed. Three of the experts were engaged in WHO health projects in public health administration, medical education and tuberculosis control.

The WHO program for 1965 included assistance to a tuberculosis control project, to the development of national health services, to a water supply program and to nursing education. An important contribution (\$1,099,414) to the nursing training program is obligated for 1966 (see Table 15).

UNICEF has provided funds (1960-1964) for projects related to basic health and social services, leprosy control, applied nutrition and training for primary school teachers (see Table 16).

ORGANIZATION OF HEALTH SERVICES

The Ministry of Health is divided into two major services, the public health service (Direction de la Santé) and social affairs (Direction des Affaires sociales), which operates 4 social centers at Niamey, Zinder, Maradi, and Magaria). The ministry has a staff of 948, of whom 506 have some training and 442 are auxiliaries. Forty-two French personnel under technical assistance serve in health (1964).

Prior to the reorganization of the public health services, their head, the Directeur de la Santé (Dr. M. Bana) had under his authority the following central services: Service des grandes endemies, nutrition service, hospitals at Niamey and Zinder, health and medical assistance, school health service, maternal and child health centers and the peripheral circonscriptions médicales or local medical posts.

Under the reorganization scheme the directorate-general of public health and social affairs will include six divisions or directorates. In June 1964 the existing central services were grouped into three directorates: (1) general administration (personnel and finance); (2) curative medicine (hospitals and dispensaries) and paramedical education; (3) health services and mobile medical units (direction de l'Hygiene et de médecine mobile) which will take over the functions of the Service des grandes endemies, and will deal with epidemiology, maternal and child health, environmental sanitation and statistical services. The other three directorates to be created will deal with (4) pharmacies and laboratories; (5) health education and nutrition and (6) social affairs.

The peripheral health services will be grouped at the level of the département under a director responsible to the préfet. Each of the seven départements will have a center including both a hospital and a health center and the headquarters of the mobile medical services.

The mobile section of the Service des grandes endemies, OMNES (Organisation médicale mobile nigérienne et d'éducation sanitaire) is based at Niamey and Zinder. Set up under the first triennial plan in 1963, OMNES is aimed at reinforcing the fixed health infrastructure of the service, carrying out mass preventive medicine campaigns and health education of the populace. At present OMNES units can examine about 300,000 persons per year. The personnel in 1963 consisted of 9 experts, 5 of whom were doctors serving under French technical assistance, and 160 nurses, nurses aides and others. Equipment consisted of 16 Berliet trucks, including well-appointed laboratory vehicles, and 29 jeeps.

In 1964, medical and paramedical personnel of the public health service included 50 doctors (40 of them under foreign technical assistance programs, the majority French); 3 dentists (2 foreign); 3 pharmacists (all foreign); and 475 nurses and 24 midwives. In a population of 3.3 million, this is a ratio of 1 doctor for 66,000 persons. (Not all medical posts are manned all the time, however, and there is more imbalance than this figure suggests; in 1964, for example, Tessaoua, with 260,000 inhabitants, had no resident doctor, whereas in some of the urban areas, the ratio may be 1:10,000.)

Only 25 of the 475 nurses and 24 midwives have standard diplomas. However, the Ecole d'Infirmiers et Infirmières at Niamey was reorganized, with help from WHO and now offers the diplôme d'état. It is hoped to increase the size of graduating classes from 30 to 75 per year.

Government medical facilities in 1964 were: 2 hospitals at Niamey (430 beds) and Zinder (350 beds); 22 medical centers and 22 maternities totalling 700 beds; 92 rural dispensaries; 4 maternal and child health centers and 4 social centers (Niamey, Zinder, Maradi and Magaria); 3 antituberculosis centers (Niamey, Zinder, Tahoua). Only the two hospitals offer surgical services. The 22 medical centers-maternities correspond roughly to the administrative divisions of the country. The 92 dispensaries, of which 5 were not operating in 1964, are situated in the

most important villages.

Private medical centers include: The Sudan Interior Mission Hospital at Galmi near Birni-N'Konni, essentially surgical and having 130 beds; 1 lepro-sarium with 300 lepers at Danja near Maradi; 1 Protestant maternity hospital at Gueschème; 3 Protestant mission dispensaries; 3 Catholic mission dispensaries. In addition, there were 4 dispensaries of the Caisse des Prestations Familiales and 4 military infirmaries (of which one is in the hospital infirmary at Niamey) which are directed by French armed forces personnel and total 107 hospital beds.

Including both government and private facilities, the total number of hos-pital beds is 1800, or 1 bed per 1834 inhabitants.

A national office of pharmaceutical and chemical products, established by the government in 1963, has a monopoly on all pharmaceutical and chemical sup-ples, including surgical supplies. It serves all state health organizations and those of public collectives; it also sells to private firms on condition that they resell at prices fixed by the state. Quinine is sold at a low price.

PUBLIC HEALTH PROBLEMS

The main health and disease problems arise from the great size and low popu-lation density of the country, and from the lack of water. It is estimated that OMNES teams travel several kilometers for every patient that they see. Further-more, the northeast of Niger is by no means settled yet, as regards law and order.

It is estimated that there were at least 139,000 cases of malaria in 1962. OMNES teams distribute a dose of 300 mg of chloroquine to each person visited. No organized vector control campaign has been undertaken yet, but it is planned to ask WHO to undertake a pre-eradication survey and to assist in strengthening the health service.

In the past Niger has had ravaging epidemics of cerebrospinal meningitis. The last serious epidemic occurred in 1962, when 15,635 cases (1387 deaths) were notified. In 1964, 2878 cases were notified, and in January-March 1965 (comprising most of the epidemic season) 928 cases. There is little doubt that the quiescent period is temporary. WHO has set up a depot of sulfa drugs, to serve all the surrounding countries, at Niamey.

There are at least 30,000 known cases of tuberculosis. Following a survey, WHO undertook a campaign at government request in October 1964. A pilot zone was set up, to permit evaluation of the disease, and a BCG vaccination campaign is being prepared. Particular efforts will be made to train specialized person-nel for the campaign. Tuberculosis services exist at Niamey and Zinder hospitals. Reconstruction of the Zinder center, and construction of new tuberculosis centers at Niamey and Tahoua, are planned. Non-pulmonary tuberculosis is said to be common.

Measles is a principal cause, direct and through complications, of infant mortality. In 1964 there were 14,412 cases and 555 deaths and 25,943 cases with 536 deaths during the first nine months of 1965. The U.S. AID program of vac-cination began in spring 1964, with inoculation of 18,000 children in the Niamey area. In 1964-1965, 197,940 doses of vaccine were provided, and for 1966,

177,000 doses. The campaign is being carried out by the Service des grandes endemies.

At the end of 1964, there were records of 21,845 cases of leprosy, of which 314 were apparently cured and 1716 had been placed under surveillance without further treatment. Self-treatment (with sulfamethoxyypyridazine, not sulphones) was begun in 1963 for the sedentary population and extended to nomads in 1964. At the end of six months' self-treatment, the patient is examined by a nurse who then decides on the nature of further treatment. There is a private leprosarium at Danja near Maradi, and the creation of a leprosarium near Zinder is under study.

Onchocerciasis is said to be the basis of 20 per cent of eye disease in adults. High rates of endemicity have been found in two foci west of the Niger, Bokou and Tamou. In certain villages 100 per cent of adults are infected. Some cases of bancroftian filariasis have been found near Say.

Venereal diseases occur with great frequency in all parts of the country, and endemic syphilis is common among the nomads. In 1964, seropositivity rates of 14 per cent and 25.75 per cent were found by OMNES teams at Tillabery and Tahoua respectively. The penicillin campaign against endemic syphilis continues, and 5546 new cases were notified in 1964.

Foci of Schistosoma haematobium infection have been surveyed at Tillabery, Magaria and Tessaoua; infection is also common among nomads. Niger, like Mauritania, is a dry country in which surface water, where it is found, is much frequented by human beings. Bilharziasis is therefore a serious problem. S. mansoni infection has not yet been found.

Smallpox is one of the few diseases against which most of the population is protected; there were only 29 cases (with 4 deaths) in 1964 but 477 cases were recorded in 1965. Vaccinations are renewed every six years; in 1964, 246,688 vaccinations were administered.

Sabin oral trivalent vaccine, furnished by the Moscow Institute of Poliomyelitis, is administered to children under 10 years of age.

HEALTH DEVELOPMENT PLANS

Three priorities for development of the health services are emphasized by Nigerien officials: Training of more qualified personnel, education of the layman in health and sanitation matters affecting his daily life, and more comprehensive preventive medicine campaigns.

Training of personnel. Each year a stated number of students would be chosen for medical training abroad. The emphasis should be on general practice, not specialization. One proposal being considered is to have students take the first three years of general medical training in France and then return to African universities to complete their training with intensive study of tropical problems.

At the symposium on public health* (Dakar, January 1965) the Nigerien delegates (Drs. Bana and Flahaut) proposed a valuable program of special training for future African doctors (techniques of médecine de masse, tropical public health and sanitation and participation of the African physician in economic development, community activities and planning). This program of three to six months should be part of the sixth year of medical studies or following that year. The program could be given in an international training center for French-speaking students.

As mentioned above, the National School of Nursing has been enlarged and the curriculum strengthened. The school will train three categories of nursing personnel. It is hoped not only to graduate large new classes but to provide re-training for nurses now serving in the health forces.

Health education. It is planned to disseminate basic health and sanitation instruction to the Nigerien people through every level of national and community organizations—the health services, the school, the social center, the cooperative, the rural redevelopment program, the political party, women's groups and businesses. Already the curricula of primary, secondary and adult education classes are being strengthened with courses in nutrition, child care, hygiene, gardening, etc. A system of voluntary health aides is being set up in each village. The aides or secouristes are taught to cleanse wounds, administer simple medicine and, more important, to spread information about hygiene and enlist the cooperation of the populace in mass campaigns.

Preventive medicine. The ten-year plan** envisions a step-by-step rebuilding of the health services that would raise the physician cadre from 50 in 1964 to 84 (41 Nigerien and 43 technical assistance) in 1974, with attendant increases in supporting personnel, including 2 sanitary engineers. The plan calls for improvements to existing health infrastructure and the building of 6 new dispensary hospitals, 20 dispensaries, and 25 new, modern, houses for physicians. It is hoped to create a health organization built around the chief towns of the several districts, each district to have its own district office of preventive medicine, light mobile forces, and a small hospital of general medicine, surgery and maternity. Such district organizations would free OMNES to perform its true role of preventive medicine in mass campaigns and health education. By 1974, it is hoped to achieve a program of regular vaccination and prophylaxis, and a system of case finding, control and treatment of the endemic diseases, and to insure pure water and elementary sanitation in the villages. It is estimated that, if the ten-year plan can be completed, it will raise the health budget from about \$3.2 million in 1965 to \$5.3 in 1974 (of this, the cost of personnel would rise from \$1.48 million in 1965 to \$2.78 million in 1974).

* Association de la recherche médicale en Afrique occidentale et de Médecine d'Afrique noire: Colloques de Santé publique, 4-10 janvier 1965. Quatrièmes Journées Médicales de Dakar, Dakar, 1965.

** Niger: Perspectives décennales 1965-1974 de développement des services de santé. Ministère de la Santé publique, Niamey, 1964.

Table 15

Estimated WHO Commitments in Niger, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Tuberculosis control	2	2	2	\$ 31,482	\$ 29,274	\$ 33,730
National health planning	-	-	-	61,108	-	-
Nursing education	1	-	-	24,028	-	-
Nursing advisory services	2	-	-	27,722	-	-
Nursing education	-	-	-	-	1,099,414	-
Environmental sanitation	1	1	1	5,386	15,279	33,289
Fellowships	-	-	-	-	12,000	30,000
Total	<u>6</u>	<u>3</u>	<u>3</u>	<u>\$149,726</u>	<u>\$1,155,967</u>	<u>\$ 97,019</u>
Other obligations				\$ 85,000	\$ 68,000	\$134,000
Total estimated Government Contributions				101,000	101,000	

TUBERCULOSIS CONTROL (1964-1968).* To assist in establishing a national pilot area in which tuberculosis control on an integrated basis with emphasis on BCG vaccination will be carried out with concurrent training of national personnel.

This project was implemented at the end of October 1964 when the senior medical officer, and the public health nurse, reported to their duty station in Niamey. Supplies and equipment, including transport, arrived subsequently and project activities began. Preparatory to establishing a national pilot area, where primarily prophylactic measures were to be introduced to be followed if possible by a standardized and simplified case-finding and treatment program, the project endeavored during the few months of its existence to assess and evaluate the quality and magnitude of national efforts directed against the disease. Contacts with national officers responsible for developing the Government's tuberculosis services have been made with the aim of evolving a practicable and acceptable approach to the problem of expanding efficient tuberculosis control services on an integrated basis.

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*This project receives UNICEF assistance.

NURSING EDUCATION (- 1971). To assist in the reorganization and development of the School of Nursing of Niamey, wherein the Government plans to train three categories of nursing personnel, at specialist, state diploma and auxiliary levels.

ENVIRONMENTAL SANITATION (1965-1967). To assist in developing a comprehensive water supply program; to conduct a general survey of environmental sanitation conditions and make recommendations for a long-term sanitation program which will include the training of personnel.

A draft of the plan of operations was prepared in September 1964 and subsequently modified for the inclusion of UNICEF, whose assistance would consist of supplies and equipment for teaching and for the establishment of a pilot zone. The recruitment of a WHO engineer for the technical direction of the project is expected in the near future.

OTHER WHO PROJECTS

NURSING EDUCATION (1964-1968). To assist in developing nursing education programs.

The nurse educator was appointed to Niamey in July 1964.

Building is in progress for two new student hostels, and the school buildings have been expanded. Advice was given regarding lists for the required materials and equipment for these buildings, and regarding books for the school.

Assistance was given in the revision of the programs for the training of auxiliaries and state diploma nurses and midwives. Legislation has provided for the establishment of a Council of Direction for the school and the nurse educator is a member.

Thirty students were admitted to the new program for the state diploma in February 1965, and 26 students were admitted to the auxiliary program.

A request has been submitted for assistance from the UN Special Fund to enlarge the scope and objectives of this project.

NURSING ADVISORY SERVICES (1964-1968). To assist establishment of nurse training and to assist the development of the nursing services in accordance with the country's needs.

A nurse educator was reassigned to this project in November 1964. Her activities have been closely related to those of the other senior nurse educator in the nursing education project, in the preparation of the programs at the school of nursing.

It is anticipated that both projects will be funded by the UN Special Fund from 1966.

PUBLIC HEALTH ADMINISTRATION (1962-1965). To assist in the development of national health services.

The WHO planner has prepared some reports, the latest of which entitled "Perspectives décennales 1965/1974 du développement des services de santé dans la République du Niger" was submitted in July 1964. This report is the result of the work of government teams, international and bilateral assistance to the Government to help establish the socio-economic development plan for the Republic.

The Government plans to implement the report. Around this national health planning project, and in connection with it, WHO-assisted projects have developed, with a view to the integration of all public health activities in the Republic of Niger.

Table 16

UNICEF -Aided Projects in Niger, 1960-1964

Total allocation: \$336,000

	Approved 1960-64
BASIC HEALTH AND SOCIAL SERVICES	\$ 74,000

UNICEF is providing basic medical equipment and home economics equipment for the maternal and child health centers (at Niamey, Zinder, and Maradi) and the new medical social centers (at Magaria and later at Agadez, Tahoua and Birni N'Konni), vehicles and motor bicycles for nurses and social workers; also milk, drugs and vitamins. WHO is providing a public health adviser and a nurse. UNICEF is also providing laboratory and health education equipment for the new mobile medical service.

	Approved 1960
LEPROSY CONTROL	\$ 36,100

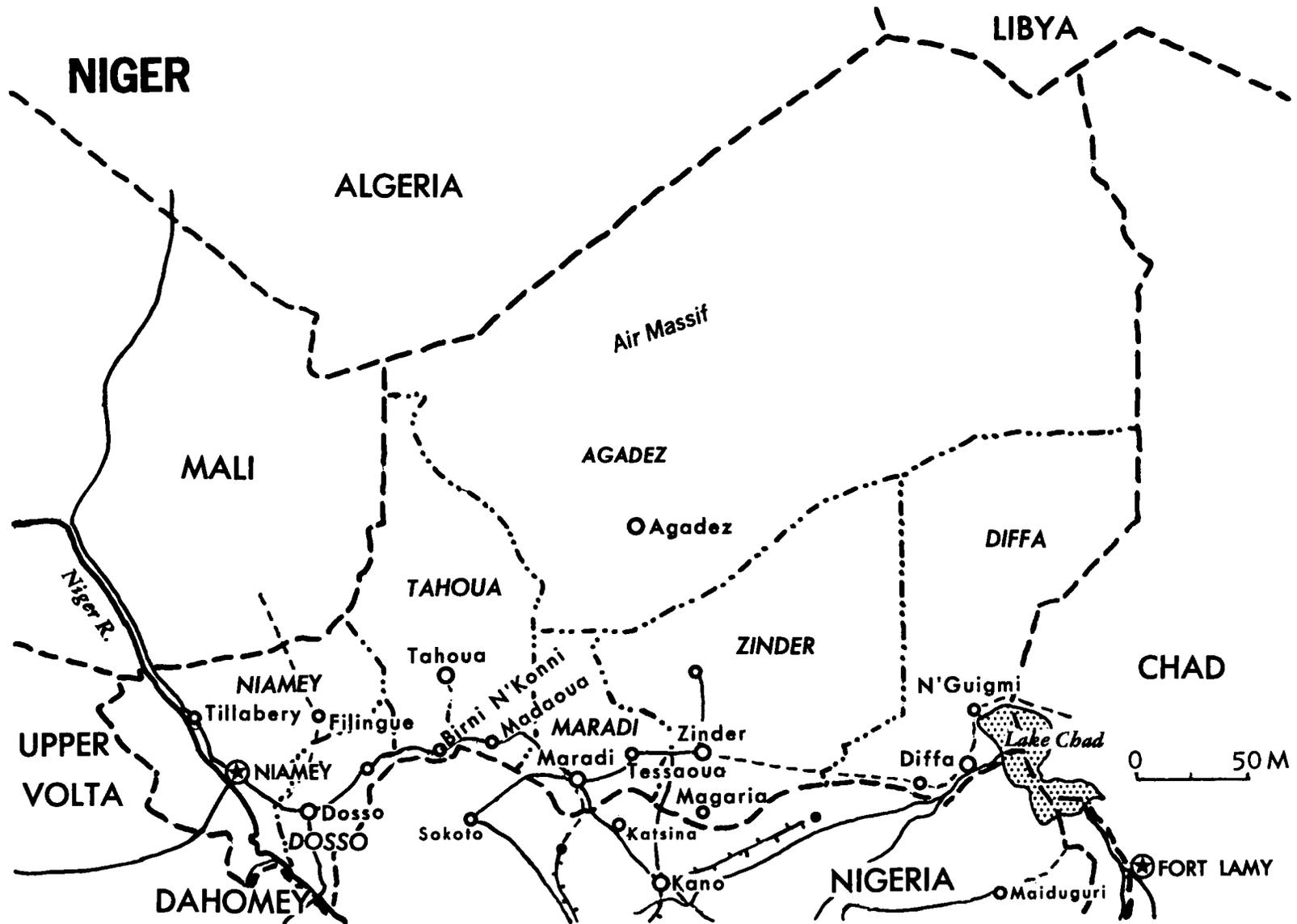
UNICEF assisted (1960-61) in the continuation of this project.

	Approved 1962
APPLIED NUTRITION	\$ 139,200

The project aims at the improvement of the nutrition first of pre-school and school-age children and eventually of the entire population. UNICEF is providing equipment and supplies for nutrition survey by the national nutrition service (SNAC), school canteens and demonstrations; food supplements for the school canteens, six vehicles for the survey; stipends for field training. FAO continues to provide technical staff and fellowships.

	Approved 1963
EDUCATION	\$ 87,000

UNICEF provides reproduction, audio-visual and demonstration equipment for the mobile teams for refresher training for primary school teachers and for the regional refresher training centers; also transport and partial payment of stipends for 160 teachers.





REPUBLIC OF SENEGAL

Population:	3,360,000 (1963)	Number of doctors:	173 (1963)
Area:	76,000 sq. mi.	Doctors per population:	1:19,400
Capital:	Dakar	Hospital beds:	4500 or 1:750

GENERAL

Geography and topography. Senegal, covering 76,000 square miles (about the size of Nebraska), is located on the West African bulge. It is bounded by the Atlantic Ocean on the west, is separated by the Senegal River from Mauritania in the north; it is bordered by Mali in the east and by Guinea and Portuguese Guinea on the south. Gambia, located on the banks of the Gambia River, forms an enclave in the southwest of Senegal.

Except in the southeast, Senegal is mostly a low, flat or rolling plain with savannah-type vegetation. In the southeast the altitude rises—plateaus (with a maximum elevation of 1640 feet) form the foothill of the Fouta Djallon massif in Guinea.

There are two well-defined seasons in Senegal, with dry season from November to June. Dakar has 24 inches of rain per year between June and October. Rainfall increases substantially southwards, reaching 60 inches per year in the Casamance area. Temperatures at Dakar average 81° - 84° F during the rainy season and 60° - 66° F from December to February.

Population. Based on sampling surveys (1960-1961) the population estimate for 1963 was 3,360,000. By age distribution the population is young: 41 per cent is under 14 years of age. Population growth is estimated at 1.9 per cent per year; the total population is expected to reach 4,850,000 by 1985, the school-age population (6 to 14 years of age) 1,074,000 and the active male population (from 15 to 59 years of age) 1,291,000.

Registration of births and deaths is gradually being introduced throughout Senegal. The crude birth rate was estimated (1960-1961) at 43.3 per 1000, general death rate at 16.7 per 1000 and infant mortality at 93 per 1000 live births. Infant mortality in rural areas, according to the same estimates, varied from 116 along the Senegal River to 156 on the Cape Verde peninsula.

Population density is about 43 per square mile, but it varies from 200 in the Sine-Saloum area to 5 per square mile in the arid region of eastern Senegal. About 23 per cent of the population lives in towns, urban population is rising rapidly. Dakar, the capital, has a population of 375,000, of whom approximately 30,000 are European and Lebanese. Four other cities surpass 45,000 population: Koalack, Rufisque, Saint-Louis and Thiès.

By ethnic groups, 36 per cent of the population is Wolof (Ouolof), 17.5 per cent Peul or Fulani, 16.5 Serer, 9 Toucouleur, 9 per cent Diola and 6.5 per cent Mandingo. Smaller ethnic groups include the Sarakolles, Moors, Bassaris and Lebous. Two vernacular tongues are dominant in Senegal: Wolof and Poular, the languages of the Toucouleurs and Peuls. French is the official language. About 80 per cent of the population is Moslem and the bulk of the remainder are animists; there is a small number of Christians.

Government. The first French settlements on the Senegal River date back to 1659. In 1817 a French governor was appointed and in 1827 the peanut was introduced into the Saint-Louis area from where it spread throughout the country. About 1860 the French occupied the Dakar area and in 1885 a railroad (West Africa's first) was opened between Saint-Louis and the newly created town of Dakar. From the beginning of this century, Dakar has been the administrative, economic and cultural center of French West Africa. All inhabitants of Saint-Louis, Dakar, Gorée Island and Rufisque (known as the Quatre Communes) were automatically French citizens and had their own deputies in the French Assemblies. (President Léopold Sedar Senghor, a teacher in France, was a deputy for Senegal (1945-1946) and Secretary of State for Scientific Research in the French Government in 1955.)

Senegal remained a protectorate until 1920 when it became a French colony. While Dakar was the capital of French West Africa, the capital of Senegal was located in Saint-Louis; it was transferred to Dakar in 1958.

The Republic of Senegal was proclaimed on November 25, 1958. In January 1959, Senegal and the Sudanese Republic formed the Mali Federation, which became fully independent in June 1960, but in August 1960 Senegal decided to withdraw from the Federation, adopted a new constitution and elected Senghor as President of the Republic. A new constitution, adopted in March 1963, (replacing that of 1960) transformed the government from a parliamentary structure into a presidential system. The president, elected by direct popular vote for a four-year term, determines and conducts national policy, assures the execution of the laws and is chief of the administration. The National Assembly is a unicameral body of 80 members elected by direct popular vote. It is at present controlled by the Union Progressiste Sénégalaise (UPS) party. The party, led by President Senghor, was founded in 1949.

For the purpose of administration Senegal is divided into seven regions, each under a governor who is aided by an assistant in charge of administration and an assistant in charge of development matters. The regions and their capitals are as follows: Cap-Vert (Dakar), Fleuve (Saint-Louis), Diourbel (Diourbel), Thiès (Thiès), Sine-Saloum (Kaolack), Casamance (Ziguinchor) and Senegal oriental (Tambacounda). Each region is subdivided into départements and each département into arrondissements. There are 28 départements and 90 arrondissements. Senegal has also 33 autonomous urban communes. The commune of greater Dakar (Grand-Dakar), created in 1964 (population: 450,000) and incorporating the communes of Dakar and Rufisque, is subdivided into 9 arrondissements, each under a mayor; there is a municipal council of 80 members.

Senegal is a member of the United Nations and its specialized agencies and an associate member of the European Economic Community. It is also a member of OCAM, of OAU and of the West African customs and monetary unions. Senegal is a member of the African Development Bank and of the Inter-state Senegal River Committee (Comité inter-états pour l'Amenagement du Bassin du Fleuve Senegal).

In addition to agreements with France and the United States, Senegal has cooperation agreements with West Germany, Switzerland, Tunisia, Denmark, Italy and the USSR, and economic or commercial agreements with Lebanon, Morocco, Poland and Yugoslavia. A special interministerial committee deals with matters of common interest to Senegal and Gambia.

Education. In 1964-1965, the national education budget accounted for 11 per

cent (or \$15.1 million) of the total budget compared to 11.4 per cent for national defense and 9.1 per cent for health.

The school attendance in 1963-1964 was about 38 per cent. Primary education was provided to 186,000 pupils in 4000 classes of which 18 per cent were private. There were (1963-1964) about 19,000 students in 50 government and 24 private establishments of secondary education. Among the government schools there were 8 lycées, 1 teachers college and 25 other high schools. In 1964 out of 400 who passed the first baccalaureat (seven years of study), 200 passed the second baccalaureat (after an additional year) which qualifies them for entry into the university.

University education is provided (1964-1965) at the University of Dakar (founded in 1957) to 2450 students from 44 countries, of whom 880 were Senegalese and, to 1430 students in a number of institutes attached to the University. There are four faculties: law and economic sciences (1047 students); medicine and pharmacy (Dean: M. Payet) with 244 students of whom 52 are Senegalese; sciences 549 students, including 151 Senegalese; and letters and human sciences (610 students). Institutes affiliated with the University include the Institut français d'Afrique noire (IFAN), Institut des sciences économiques et commerciales appliquées à l'Afrique noire (ISECAAN), Institut d'études administratives africaines (IEAA) and the Ecole nationale d'administration du Sénégal (ENAS). There is further an Institute of Social Pediatrics (founded in 1960) and the Institute of Tropical Medicine.

In 1963, the total budget of the Dakar University was \$2,692,000, of which France provided \$2,181,000 and some 220 members of the teaching staff. The rector of the University is designated by common agreement between France and Senegal. He is also acting as the director of higher education in Senegal (Rector: P. Lelievre).

In 1963-1964, there were 274 Senegalese higher education students in France, of which 54 were supported by FAC grants.

ECONOMIC RESOURCES

The gross domestic product in 1964 was about \$635 million or \$180 per capita. The sources of national income by economic sector were roughly (in per cent of the total) 30 to 40 per cent agricultural production; 20 to 30 per cent manufactures and mining; and 30 to 40 per cent trade and commerce.

Agriculture and stockraising are the principal economic activities. Peanuts are the main crop and millet, sorghum and rice important secondary crops.

Peanuts and peanut products account for 85 to 90 per cent, in value, of Senegal's total export. Excellent soil and rainfall conditions and stability of export prices make Senegal, with more than 800,000 metric tons per year, the fourth largest producer of peanuts, after India, mainland China and Nigeria. Intensive research on peanut production by ORSTOM at the Bambey Center and by the French research institute for oil and oil-bearing plants (IRHO) at Louga, Tivaouane, and Darou has succeeded in raising peanut yields. Distribution of selected peanut seeds is assisted by cooperative-type associations such as the Rural Center for Development Activities. The crop is planted in June and harvested in October and November; the marketing, at some 300 assembly points, takes place from December to April.

The production of subsistence crops (mainly sorghum, millet and rice) is about 25 per cent below the country's requirements and grain, especially rice, has to be imported. In 1963 the total production was about 732,000 metric tons including 492,000 of millet and sorghum, 157,000 of root crops and legumes, 33,000 of garden vegetables (cultivated mainly around Dakar), 29,000 of maize and 96,000 metric tons of rice. Rice cultivation is carried on mainly in the north at the experimental station of Richard Toll, created by the Senegal River Commission, and also in the Casamance River valley in the south.

Livestock population is estimated at 1,816,000 cattle, 1,416,000 sheep and goats, 107,000 horses, 80,000 donkeys and 440,000 pigs. Cattle is the principal form of property of nomads in northern Senegal and is also important to sedentary farmers in central and southern areas but the productive use of these herds is relatively low. Research (and vaccine production) is insured by the Laboratoire national de recherches vétérinaires de Dakar-Hann and the Station de recherches zootechniques du Djoloff, at Dara (IEMVT).

The fishing industry is of major potential importance; out of a catch of about 98,000 tons in 1963, 81,000 were by Senegalese fishermen and the remainder by commercial fishing fleets. A survey of fish resources and the development of fishing and training will be made by FAO and UN during the next five years under a grant of \$1,212,000 approved by the UN Development Program/Special Fund.

Phosphate is the most important mining product; the calcium phosphate mining at Taïba (Thiès region) is the main mining enterprise with a production of 469,000 tons of phosphates (dehydrated to 82 per cent) in 1963 and it is expected to reach 1,200,000 tons by 1970. Deposits of alumina phosphate at Fallo (near Thiès) are also mined, and the production is increasing steadily. Ore containing rutile and zirconium found in the form of "black sand" along the coast is exported: prospection for deposits is now in progress inland between M'Bour and Joal. About 200,000 tons of limestone for making cement is mined annually.

Senegal is the most industrialized of the West African countries; highly developed agricultural production, the concentration of peanut processing in the Cape Verde peninsula area and excellent port facilities at Dakar contributed to the development of many new industrial establishments. Industries accounted for \$324,149,000 of the GNP in 1963, of which processing industries accounted for about 40 per cent. These industries cover six peanut oil refineries, four industrial bakeries, biscuit factories, soft drinks, dairy products factories, tuna fish and sardine cannery, flour mills and four soap factories. Three textile factories rely on use of domestic cotton.

Important expansion has been recorded in the production of agricultural implements, in the Berliet-Senegal truck assembling factory which now covers 90 per cent of Senegal's needs, oil-refining at M'Bao, food canning, dairy products and pasteurizing plant. New projects of special interest include an important industrial cold storage for fish destined for export, sugar refinery, meat canning (capacity up to 10,000 tons), food products made from peanuts, a tomato growing and processing concern and a fertilizer factory. According to an agreement with USSR (March 1965), a \$6,483,000 loan will be provided for building tuna fish processing facilities for 40,000 tons of fish annually.

The port and dry dock facilities and the available food and fuel supplies make Dakar a major port of call on the Atlantic. In 1963 over 4000 ships embarked

35,000 passengers and over a million tons of goods and unloaded 2,086,000 tons of goods (mainly oil, wheat and rice) and some 27,000 passengers. Koalack, Ziguinchor and Saint-Louis are both sea and river ports. The Senegal River is navigable most of the year up to Kayes (about 600 miles).

The international airport of Dakar-Yoff received (1963) 10,761 commercial planes with 67,500 non-transit passengers; airports of national importance are located at Saint-Louis, Ziguinchor and Tambacounda; the airport of Thiès, equipped to receive jet liners, also supplements the Dakar airport.

The railroad network under Senegal administration includes 7310 miles; the Dakar-Saint-Louis line has a branch line to Linguère; the main line, Dakar-Niger River (total length 800 miles) connecting Dakar with Bamako and Koulikoro (Mali) has branch lines to Kaolack and Touba. All traction is by diesel locomotives.

The road network included (July 1964) 960 miles of hard surface, 795 miles of earth roads and about 6900 miles of unsurfaced roads. There were about 48,000 vehicles including 16,000 trucks and 2372 buses. About two-thirds of all vehicles are concentrated in Dakar and the Cape Verde peninsula.

Senegal has no hydroelectric power; in 1963 the main thermal station at Dakar-Bel Air of 60,000 kw supplied 175 million kwh while the five other power stations of Senegal supplied a total of 2.76 million kwh.

In spite of the development of its industry and trade, Senegal was unable to achieve the agricultural and industrial diversification and an adequate rate of economic growth outlined in its four-year development plan (1961-1965). A substantial share of funds expended under the plan has gone for educational and social infrastructure rather than into productive investment, thus raising the government expenses more rapidly than the revenues. The plan which terminated in June 1965 was revised, raising the investment from \$373 million to \$394 million; the raise benefited all sectors except industry and commerce and public health.

The second plan (1965-1969) aims at a 6 per cent rise in the GNP while restricting the rise of private consumption to 5.7 per cent. The success of the plan will depend on the acceleration of the investment rate; total investments, public and private, should reach, by the end of the four-year period, about \$122 million.

Senegal's economy is faced by a grave problem resulting from the withdrawal by France of price support for peanuts and the obligation, under the Yaoundé Convention signed with EEC (July 1963), to align the price of peanuts to the world market level.

As is known, peanuts account for 20 per cent of the gross national product and 80 per cent of the export value. The adjustment of the price to the world market level could result in a loss of \$24 million out of a gross income of \$100 million. However, in 1964, Senegal did not suffer any loss, as EEC's development fund provided \$46 million in aid to Senegal, to be spread over a period of five years, of which \$15 million was to be used for price supports.

The withdrawal of French troops will cause a loss to Senegal's income of some \$28 million per year.

Senegal is cooperating with neighboring Mauritania, Mali and Guinea in devising plans for joint development of the Senegal River basin. A UN technical mission is assisting in this project. The secretariat of the committee (Comité inter-états pour l'Amenagement du Bassin du Fleuve Sénégal) is located at Bamako.

NATIONAL BUDGET

For 1965-1966, Senegal's estimated operating budget totaled \$137.7 million of which \$12.2 million, or 9 per cent, accounted for health services. Based on an estimated population figure of 3.36 million, the average per capita provision for health services was \$3.15, one of the highest among the French-speaking countries of Africa. The following table gives budget data for the last five years (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs per capita*
1961	\$ -	\$140,306	\$ 8,923	6.4	\$2.65
1962-63	170,989	134,128	10,535	8	3.15
1963-64	192,352	128,906	8,914	7	2.65
1964-65	186,175	137,662	12,520	9	3.75
1965-66	164,919	137,662	12,232	9	3.65

* Estimated population 3,360,000 (1963).

The per capita cost of health services as shown in the table is below the real cost as it does not take into consideration the cost of personnel provided by France under the technical assistance program.

The increase in the health budget for the year 1964-1965 was due to the cost of services in connection with new hospitals and other institutions.

The health budget of Senegal would deserve a close study in view of the lack of balance between the cost of hospital services and the expenditure in connection with peripheral health services; it was stated that in 1965 two thirds of the operating health budget was spent on hospitals in Dakar.

ASSISTANCE PROGRAMS

French investment in the health activities of Senegal through the FAC from 1959 to February 25, 1964 amounted to \$2.6 million. These commitments pertained to the Thiaroye Psychiatric Hospital (\$325,000); the Ziguinchor Hospital (\$386,000); an extension of Le Dantec Hospital at Dakar (\$873,000); preliminary work at the Saint-Louis Hospital (\$203,000); construction of a school for staff members of mobile medical units at Khombole (\$162,000); construction of rural maternity clinics (\$162,000); and the campaign against endemic diseases (\$487,000).

Health and sanitation projects supported by U.S. AID for FY 65 related to water resources survey and training of personnel (see Appendix 1, p. 146). According to the U.S. AID representative in Dakar, the major projects in 1965 included the \$300,000 water exploration program and a \$1.5 million loan for the construction of five regional vocational schools. Under the Food for Peace

program (PL-480), AID completed in 1964 a transaction of \$3.4 million in rice; half of this amount being a 40-year loan to Senegal.

In accordance with an agreement signed in March 1965, West Germany undertook the construction of a 120-bed regional hospital (value \$2 million) at Diourbel.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in Senegal totaled \$37 million for 20 projects. Of this amount, health and sanitation projects amounted to \$7 million (see Table 3, page 68). Other commitments involved transportation, agriculture, schools and a research institute. Of the \$7 million, \$4.6 million represents the investment program for health infrastructure relating to building a hospital at Saint-Louis (\$4,254,000); tuberculosis control (\$122,000) and the blood transfusion center at Dakar (\$203,000).

Project costs of the United Nations Expanded Program of Technical Assistance for Senegal in 1964 totaled \$336,691. Some of these projects included assistance from ILO for manpower organization, small-scale industry and labor conditions and administration (\$44,191); from FAO for plant production, nutrition and fisheries development (\$99,383); from UNESCO for education, mass communication, social sciences and scientific research (\$78,470); and from WHO for rural health services, health education and training (\$53,738). Twenty-four experts were involved in these projects and 10 fellowships were awarded nationals.

WHO assistance programs during 1965-1967 (see Table 17) relate to the continuation of the development of basic health services in connection with the future malaria eradication activities, tuberculosis and leprosy control, vital and health statistics, nursing advisory services, health education, nutrition, environmental sanitation in rural health services and assistance to public health teaching at Dakar University.

UNICEF has provided funds for projects relating to basic health services and maternal and child health services, environmental sanitation, leprosy control, applied nutrition and development of high-protein food, and community development (see Table 18).

ORGANIZATION OF HEALTH SERVICES

The health services are under the Ministry of Public Health and Social Affairs. The Minister (presently Mr. Dembo Coly) is assisted by a minister's office, a technical adviser and the director of health services. The directorate has a number of divisions dealing with the control of endemic diseases (Service des grandes endemies) (Director: Dr. Lacan), hospitals and clinics, and maternal and child health; there are technical services for sanitation, health education (Centre national d'Education sanitaire) and statistics. There is also a division of social affairs.

Public health functions have been decentralized and emphasis placed on health education, sanitation and other preventive measures at every level. Peripheral health administrations were set up in each of the seven administrative regions, each with a laboratory and a hospital with a pediatric and maternity ward. The network when completed and fully staffed will comprise 38 main health centers, 87 sub-centers and 101 village dispensaries.

For the purpose of control of endemic diseases the country is divided into

sectors (4 permanent and 3 temporary) each served by fixed dispensaries and mobile units. The mobile sectors have 210 vehicles, of which 86 serve the Cap-Vert (Dakar) Region and 25 the Fleuve (Saint-Louis) Region. School health services are under the Ministry of Education. The Dakar area (Grand-Dakar) has its own health and sanitation services. The Ministry cooperates closely with OCCGE; one of the OCCGE's institutions, the Office de recherches sur l'alimentation et la nutrition en Afrique, ORANA, is located in Dakar.

The public health and medical equipment of Senegal includes three main hospitals in Dakar: the main hospital (641 beds), hospital Le Dantec, (1000 beds) and the Fann-Dakar hospital center; one hospital at Saint-Louis (561 beds) and 4 secondary (future regional) hospitals at Kaolack, Diourbel, Ziguinchor and Thiès; there are 38 main health centers (about 800 beds), 39 maternity units (about 1000 beds), 259 rural dispensaries. There is one polyvalent dispensary at Dakar with a dental center and an anti-tuberculosis service. The maternal and child health (service) includes one pilot center at Dakar, 9 primary and 67 secondary centers in other parts of the country. The total number of hospital beds can be estimated (1965) at 4500, of which about 2000 are in the Dakar area. The average ratio in Senegal is 1 hospital bed per 750 population, but the ratio is about 1 per 220 in the Dakar area and 1 per 1170 in the rest of the country; excluding the Saint-Louis area, the ratio is still lower.

The staff employed by the Ministry included (1963) 141 physicians, 8 pharmacists, 5 dentists, 133 midwives, 572 male nurses and 167 female nurses. French personnel provided under technical assistance numbered 83 (December 1964) including 56 physicians. There were in private practice (1963) 32 physicians, 14 dentists, 18 midwives and 41 pharmacists. In 1965 there were in Senegal some 200 physicians (about 1 per 16,800 population); of these 160 resided in the Dakar area, serving a population of 450,000, leaving about 40 physicians to serve almost 3 million. Maldistribution and shortage of qualified personnel account for the slow progress in the development of peripheral health services and rural dispensaries. Low salaries, poor housing conditions and isolation are some of the reasons for the reluctance of young physicians to serve in rural areas. These conditions also affect the recruitment: there were only three Senegalese first-year medical students at the Dakar Medical School in 1965.

Funds destined for the peripheral services are inadequate. It was stated that the cost of hospitals of Dakar absorbs two thirds of the annual public health budget of the country. The three central hospitals in Dakar serve as referral hospitals for the whole country but only about 15 per cent of the children, for instance, come from outside the town area; the proportion of adult cases is probably the same.

In addition to shortage of staff, rural dispensaries and health centers are faced with the problem of inadequate supply of drugs. Often a three-month supply is barely sufficient for 15 days. The supply is especially insufficient in drugs for treatment of malaria (Nivaquine) tuberculosis (INH, BCG), treponematoses (extencillin) and for treatment of helminthic diseases.

PUBLIC HEALTH PROBLEMS

The main problems appear to be the shortage of trained personnel, the need for the development of rural health services, control of communicable diseases and sanitation. The main objectives of the Four-Year Health Plan (see pages 76-77)

integrated in the Second National Four-Year Plan (1965-1969) will be strengthening rural rather than urban health services, preference for mass treatment over individual medical care, preventive medicine and health education. These objectives are to be reached by (1) giving high priority to training personnel, (2) raising the share of health in the general budget (it was only 6.5 per cent in 1963-1964, raised to 9 per cent in 1964-1965), (3) reinforcement of regional hospitals and rural health centers; strengthening of the control of endemic diseases, of the action against malnutrition, and of environmental hygiene, and (4) priority to building and equipping regional hospitals rather than large hospitals in the main centers.

The Under-Commission for Health and Social Affairs, as well as the advisers in the Ministry of Health, have some misgivings regarding this Plan in view of the shortcomings of the first Four-Year Plan due mainly to shortage of investment credits. Investments under the second Plan will probably call for outside (bilateral or multilateral) assistance. However, such aid must be studied carefully regarding the resulting recurrent expenses.

Endemic diseases. Among the problems related to diseases and their control the following should be mentioned.

Malaria follows the usual West African pattern and is responsible for 5 per cent of physicians' diagnoses and 9 per cent of dispensary diagnoses. A survey by the Faculty of Medicine of Dakar confirmed that the disease is hypoendemic and mesoendemic in the coastal zone, becomes gradually hyperendemic further east, reaching holoendemic conditions (spleen-rate in children 2-10 years of age constantly over 75 per cent) in the area around Tambacounda.

Onchocerciasis is prevalent in the east. A focus related to the Falémé River, a tributary of the Senegal, with blindness rates as high as 15 per cent, was discovered as recently as 1962. There are foci along the course of the Gambia River, from Kédougou to Dialakoto; these are continuous with foci in Guinea. The disease is present in most of the villages south of a line from Dialakoto to Kidira (on the Falémé River).

There are many foci of Schistosoma haematobium infection, throughout the country, and scattered foci of S. mansoni have been found. Researches on the clinical effects of bilharziasis have been published by members of the Faculty of Medicine at Dakar. The Endemic Diseases Service is experimenting with Zirame, a molluscicide developed by Pasteur Institute workers. Sleeping sickness was endemic in many areas both north and south of the Gambia. Among former epidemic foci, still persisting in an endemic state, is M'Bour, 55 miles from Dakar. Here a recent survey by Pasteur Institute staff, using the β_2 macroglobulin test revealed 62 active cases of the disease.

Leprosy is still an important problem. At the end of August 1965 there were about 41,000 known cases requiring treatment. UNICEF continues to provide drugs and equipment while WHO is assisting in establishing a program of control (see Table 17).

Endemic syphilis was common among the pastoral Peuls, but has been reduced by mass penicillin campaigns. Nearly 30 per cent of hospital attenders in Dakar taken at random react positively to serological tests for treponematosi. Yaws was formerly common in the Casamance, south of the Gambia, but has been almost or

quite eradicated by penicillin campaigns.

Yellow fever has been extremely rare until recently; except for two cases (Europeans at Boulel, 1953), the country was apparently free from the disease between 1943 and 1965. Vaccination, introduced in 1940, became compulsory in 1941. However, in 1959 the vaccination of children under 10 years of age was discontinued owing to the tendency of the Dakar vaccine to produce encephalitis in young children (see page 100). In November 1965 an outbreak with 72 cases of yellow fever among children (age: from 6 months to 14 years) occurred in the Diourbel area (Diourbel, Bambey, M'Backé). Vaccination of children with the imported 17D vaccine is now in progress; it covers children under 2 years of age in the Diourbel area, under 4 in the Cap-Vert region and under 6 years of age in the rest of the country.

The Pasteur Institute, Dakar, wishes to commence the production of 17D vaccine. Meanwhile, a dilution technique developed by the Institute has lowered the cost of a dose to about U.S. 8 cents.

The smallpox vaccination level is fairly high in Senegal. Two cases of smallpox were notified in 1964 and none in 1965.

Tuberculosis is probably widespread although the attendance figures in the Dakar area dispensaries are low. Pulmonary tuberculosis is probably very common among the Peuls. The Pasteur Institute, Dakar, is now producing lyophilized BCG vaccine. The Institute is also investigating drug resistance (see page 118). In 1966, WHO will assist in developing a national tuberculosis control program (see Table 17).

Measles is an important problem on account of high fatality and complications. Among some 4500 in-patients in the infectious diseases hospital at Dakar (1960-1962), measles accounted for 31 per cent of the admissions and 32 per cent of all deaths; the case fatality rate in this series of cases was 13 per cent.* The same study shows that tetanus is the third highest cause of admission (after malaria and measles) accounting for 11 per cent of the total and for a case fatality of 23.4 per cent.

TRAINING AND TEACHING

As stated above, the second Four-Year Health Plan (1966-1969) gave the highest priority to training of personnel. In this connection, the Under-Commission for Health and Social Affairs specified that the entire problem of training and retraining for specific tasks will be studied and special emphasis will be given in the training to public health, epidemiology, health education, sanitation and maternal and child health; provision will be made for postgraduate training for certain categories of personnel; remedial action will be taken to deal with the loss of interest by the Senegalese youth for the medical and paramedical professions.

* Armengaud, M., Louvain, M., Sanokho, A., Diop Mar, I., Chambon, L., Hoquet, P. & Baylet, R. J. Le terrain de l'Africain devant l'infection. Considérations à propos de 4521 malades hospitalisés dans un service de pathologie infectieuse à Dakar. Bull. Soc. Méd. Afrique Noire Langue française. Dakar. 1962, v. 7, No. 3, 435-43.

The Dakar School of Medicine referred to in Volume I (pages 128, 131 and 138) has a total enrollment (1964-1965) of 244; of the 144 undergraduate students, only 52 were Senegalese (medicine 22, pharmacy 28, dentistry 2) and only 3 of them in the first year of medicine. This alarming situation led the government of Senegal to consider the re-establishment of a school for medical assistants (see page 131). The proposal for this new Ecole de médecine africaine was made by Ibra Mamadou Wane, minister of national education, in January 1965.*

Teaching of public health was discussed at the symposium on public health held in Dakar.* The Conference recommended (see page 132) that teaching of public health should be developed within the university curriculum. A special post-graduate diploma in public health was thought to be desirable but it was stated that "the small number of those requiring such diploma would not justify the setting up of a special school in Dakar." However, one of the Senegalese delegates (Dr. Wone) was in favor of a School of Public Health to be set up under the sponsorship of West African countries or under the UAMCE (OCAM). Meanwhile, as is known, a WHO consultant recommended the creation of a school of public health at the University of Dakar destined for French-speaking doctors (see Table 17).

Since 1962 general paramedical training is provided at the School of Nursing at Saint-Louis under a WHO sanitarian. After a year of specialization, 11 students were graduated and were posted to the major medical centers. Midwives are trained at the School of Midwifery at Dakar (see page 138). Sanitarians are trained at the new school in the pilot zone of Khombole.

The Khombole Rural Health Center was set up with UNICEF, FAO and WHO assistance in 1956 with the aim of studying family care within the wider framework of public health problems and of establishing a demonstration area for the students of the Dakar School of Medicine. The center serves the 4000 inhabitants of Khombole and also the 40,000 inhabitants of the surrounding area. The medical and social services are directed by a médecin africain assisted by a midwife, a male nurse and four auxiliaries. The facilities include a dispensary, a maternity home (24 beds) and an in-patient building (20 beds); its annual budget is only \$4000. Student nurses and midwives from Dakar schools spend a week in the center during each year of their studies and final-year students attend a practical course during their holidays. The School of Sanitarians was opened in April 1964 (see Table 17) under the direction of a public health engineer.

Nutrition is of special interest to the government. WHO and UNICEF assisted in a number of projects (see Tables 17 and 18), some in close collaboration with ORANA.

THE PASTEUR INSTITUTE, DAKAR

Reference to this Institute, created in 1927 and whose role in epidemiology, diagnosis and prevention of communicable diseases has been invaluable, was made in Volume I (pages 41-42, 118). The Institute, financed by the Pasteur Institute, Paris, is producing most of the vaccines; its current research relates to

* Association de la recherche médicale en Afrique occidentale et de Médecine d'Afrique noire: Colloques de Santé publique, 4-10 janvier 1965. Quatrièmes Journées Médicales de Dakar, Dakar, 1965.

trypanosomiasis, arboviroses and tuberculosis. The Institute's four-year (1966-1969) research program includes, among others, studies on trypanosomiasis and rickettsial diseases in cooperation with OCCGE and on malaria, insecticides and on pathological anatomy of Burkitt's disease under contracts with WHO.

Table 17

Estimated WHO Commitments in Senegal, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	4	4	4	\$ 27,703	\$ 64,831	\$ 68,833
Tuberculosis control	-	-	3	-	21,000	43,160
Leprosy control	-	-	-	1,200	-	-
Vital and health statistics	1	1	1	14,065	19,644	21,688
Nursing advisory services	1	2	2	15,860	29,168	27,421
Health education	1	1	1	13,905	20,454	22,498
Nutrition	1	2	2	19,569	33,126	31,448
Environmental sanitation in rural health services	2	2	2	35,799	36,141	42,549
Assistance to Public Health teaching at the University of Dakar	-	-	-	-	-	10,200
Total	<u>10</u>	<u>12</u>	<u>15</u>	<u>\$128,101</u>	<u>\$224,364</u>	<u>\$267,797</u>
Other obligations				\$124,100	\$129,100	\$125,000

MALARIA PRE-ERADICATION PROGRAM (1965-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Senegal can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

TUBERCULOSIS CONTROL (- 1968). To assist towards developing a national tuberculosis control program by introducing a national pilot area where simplified tuberculosis control measures will be carried out, with training of national personnel.

LEPROSY CONTROL (1960-1966).* To assist in establishing a program of leprosy control.

* This project receives UNICEF assistance.

UNICEF continued to provide drugs and equipment. Out of a population of approximately 3,000,000 a total of 45,164 leprosy patients were registered at the end of 1964. Treatment was attended by 20,962, 15,901 attended regularly and 2124 were under "autotraitement." A total of 4919 patients were considered as cured, it is to say 10 per cent of patients.

VITAL AND HEALTH STATISTICS (- 1968). To advise on and assist the establishment of a unit of vital and health statistics in the Ministry of Health and the development of peripheral statistical services.

NURSING ADVISORY SERVICES (1964-1968).* To assist the development of the basic program of nursing education and with the integration of public health aspects in all programs for nurses and midwives.

The public health nurse educator visited health services in Dakar and the north of Senegal to plan for student experience in public health nursing. She has also given instruction in the theory and practice of public health nursing to students of the school of nursing. Individual records were prepared for the supervision of student health. Assistance was given with the reorganization of the program at the school of nursing, which will be extended from two to three years.

HEALTH EDUCATION (- 1968). To assist the development of the Health Education Unit in the Ministry of Health and the extension of health education methods in the health and other services and at the University of Dakar.

NUTRITION (1964-1967). To assist the development of nutrition training for students in the University of Dakar and other associated institutions and to assist integration of nutrition education in the curricula for training of medical students, nurses, midwives, and public health inspectors.

Nutrition teaching has been undertaken in the following institutions: Faculté de Médecine, Institut de Médecine Tropical, Institut de Pédiatrie Sociale, Ecole d'infirmières d'Etat et de Sages-femmes, Centre de formation Pédagogique, Ecole nationale des cadres ruraux, Ecole des agents d'assainissement de Khombolé. This teaching consisted of 140 hours study and discussions and 46 hours practical work. Two-thirds of the course was given by the WHO consultant who participated also in the organization of practical teaching within the framework of the postgraduate training course, Paris-Dakar.

Research work is in progress on the following subjects: nutrition education and the state of health, anemias and ancylostomiasis, feeding habits and the nutritional state. These studies are carried out in collaboration with ORANA, the Faculty of Medicine, the Maternal and Child Health Service and the Institute of Hygiene.

ENVIRONMENTAL SANITATION IN RURAL HEALTH SERVICES (1960-1967).* To train sanitation personnel; to assist the general health program in improving environmental sanitation conditions in rural areas and to establish a unit of sanitation within the Ministry of Health.

* This project receives UNICEF assistance.

The Ecole d'agents sanitaires, Khombolé, which has residential accommodation for 32 students, has been opened. Sixteen students registered in 1965 for theoretical courses and 12 agents sanitaires trained in 1964 are following a six-month practical course. In the Khombolé demonstration zone work on the construction of wells and latrines continues in six villages with a total population of approximately 5000 persons. In one of these villages, where the dwellings are very scattered, the chief consented to the regrouping of the village around the well under construction, which will permit the planning of a model village.

The WHO engineer has been nominated as a permanent member of the Waterworks Commission and gives advice on all matters pertaining to water. He is interested in the problem of improving the Dakar water supply, for which the Government has asked additional assistance from WHO.

OTHER WHO PROJECTS

AID TO THE SCHOOL OF PUBLIC HEALTH, DAKAR (December 1964).* To advise the WHO Regional Director on ways of possible WHO assistance in the creation of a School of Public Health at the University of Dakar.

A WHO consultant visited Senegal from 29 November to 19 December 1964. His report contains the following recommendations:

The creation of a school of public health devoted to preparing French-speaking doctors to fill posts for health officers and medical administrators in the African Region should be encouraged; this school should be of international standard. It would be advisable to locate the school at the University of Dakar, within the joint Faculty of Medicine and Pharmacy preferably to be housed with the Institute of Tropical Medicine; the latter should organize a well-developed and equipped department of preventive medicine with the following sections: statistics, epidemiology, public health administration, nutrition, maternal and child health, health education and sanitation; in order to help the training of teaching personnel for a Department of Preventive Medicine, the possibility of awarding travelling grants should be considered to facilitate visits to recognized schools of public health abroad; in addition, a certain number of fellowships should be held in readiness for young medical doctors of African nationality who, after taking the course of applied tropical medicine which started in 1964 in the Medical School, Dakar, wish to become full-time members of the Department of Preventive Medicine.

SPECIAL ACCOUNTS

A supplement to the provision of the regular budget was allocated by the Malaria Eradication Special Account for the years 1965 to 1967 successively \$7000, \$9000 and \$15,000. Another supplement was granted by the Community Water Supply Special Account for 1965 in the amount of \$5600.

* This project receives UNICEF assistance.

Table 18

UNICEF-Aided Projects in Senegal, 1960-1964

Total allocation: \$708,000

BASIC HEALTH SERVICES	Approved 1960-64 \$ 235,000
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UNICEF provided basic maternal and child health equipment for 11 primary, 78 secondary centers. For the extended public health program (1962) UNICEF is providing basic equipment for health centers, sub-centers and dispensaries; teaching material for three schools and the maternity department of the Dakar Faculty of Medicine; radio diagnostic equipment for seven regional and seven main health centers; audio-visual equipment for health education; drugs and diet supplements, kits for doctors, nurses and midwives; vehicles; stipends. WHO is providing the services of a health educator and a nurse educator.

ENVIRONMENTAL SANITATION	Approved 1961 \$ 33,500
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UNICEF is providing training and demonstration materials for the environmental sanitation demonstration project, transport, equipment for a research laboratory, pumps and other equipment for improvement of water supplies; materials for a central workshop for the construction of latrines. WHO is furnishing the services of a sanitary engineer and a sanitarian.

LEPROSY CONTROL	Approved 1960 \$ 113,000
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UNICEF has provided drugs, equipment and transport to maintain the campaign (1960-63).

APPLIED NUTRITION	Approved 1962 \$ 165,000
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UNICEF is providing teaching and demonstration equipment for teacher-training schools and primary schools, equipment for 122 school canteens and 75 school gardens; vehicles and reimbursement to FAO for two experts. All basic foodstuffs for the school children at the equipped canteens has been provided by the World Food Program, UNICEF contributing only the necessary complement of products produced in Senegal which the World Food Program is unable to deliver.

HIGH PROTEIN FOOD DEVELOPMENT	Approved 1964 \$ 65,000
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The object of this project is to demonstrate the feasibility of establishing permanent production and distribution channels, primarily commercial, for a nutritious food supplement for pre-school children (one to six years of age), with emphasis on the one-to-four-year age group. The Government of Senegal has requested the World Food Program to supply 1800 tons of sorghum and 60 tons of skim milk powder for the period of the pilot project (1964-1965). According

to the original plan, UNICEF was to furnish 400 tons of groundnut flour, purchased from the UNICEF-assisted plant in Bombay, to initiate the project, with local production in Senegal to begin at a later date. However, it has proved impossible to obtain non-toxic groundnut flour in India. Thanks to recent scientific developments, it is now expected that local production can begin very soon in Senegal, and the plan has been revised accordingly. The project is being carried out in an experimental zone at Gossas under the supervision of the Institute of Food Technology and the biological control of ORANA. The initial results have been promising, and it is hoped that a safe mixture will be ready for distribution in 1965.

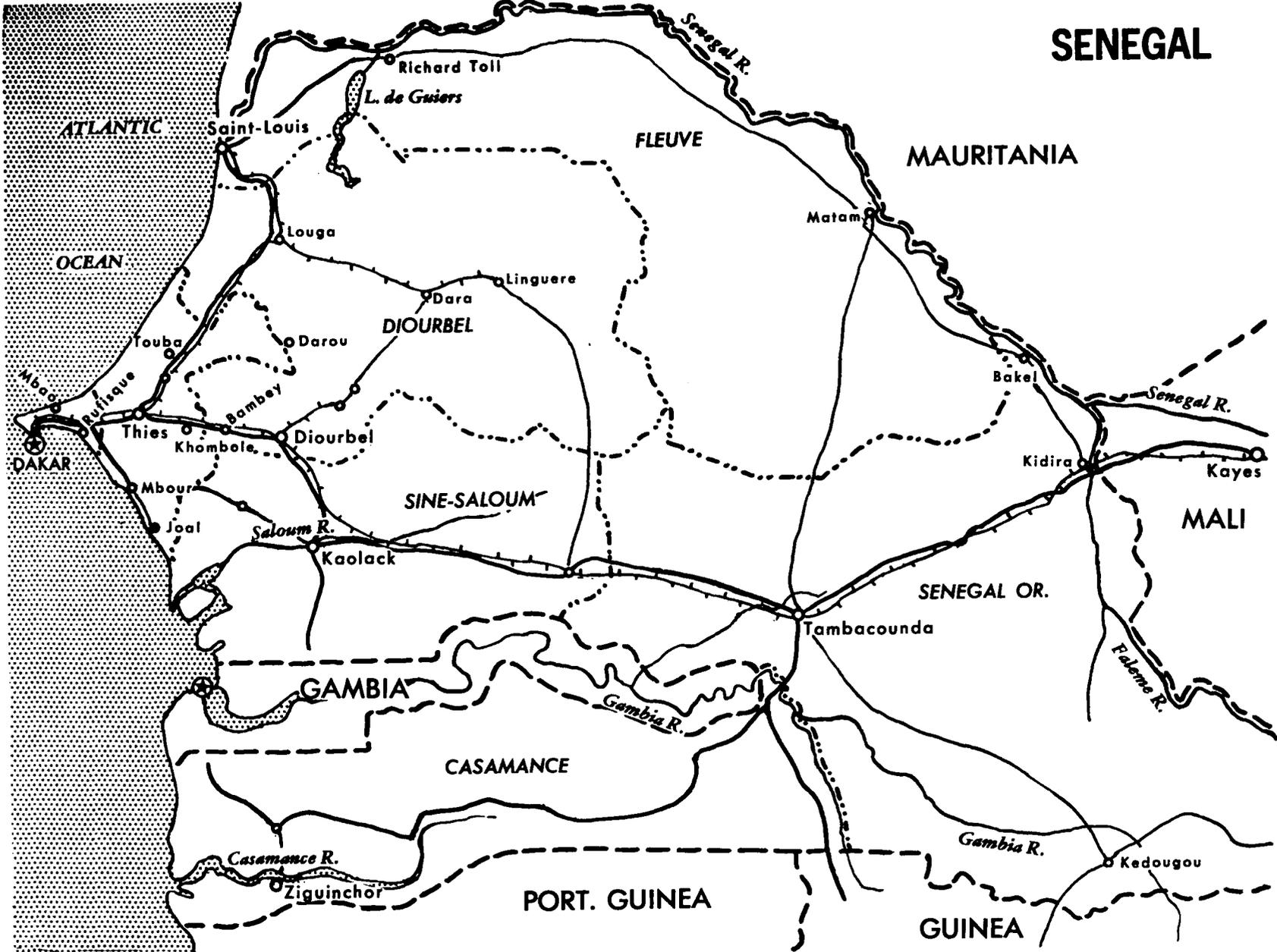
The product will be pre-cooked and packaged by a reputable commercial firm in Dakar for distribution by the Société de Production d'Aliments, a Government-sponsored commercial marketing firm. Twenty per cent of the mixture will be distributed free through maternal and child health centers. About 80 per cent will be distributed commercially through SOPRAL, at a price within reach of the lower income groups. Any profits from the sales will go to the Institute of Food Technology to finance further promotion of the product. A study will be made of the patterns of purchases by various income groups and of the nutritional effects of the project. UNICEF is providing part of the equipment necessary for the development and testing of groundnut flour, including drying and laboratory equipment, as well as salary supplements for agricultural assistants working on the project. FAO continues to provide technical assistance through the team of experts (two food technologists and two nutritionists) who are already in Senegal.

Approved 1964
\$ 55,000

COMMUNITY DEVELOPMENT

In connection with the training program of animateurs ruraux, UNICEF is providing audio-visual equipment, transport and stipends. ILO and FAO are participating in a complementary project assisted by the UN Special Fund.

SENEGAL



REPUBLIC OF UPPER VOLTA

Population:	4.7 million	Number of doctors:	58
Area:	106,000 sq. mi.	Doctors per population:	1:81,000
Capital:	Ouagadougou	Hospital beds:	2900 or 1:1620

GENERAL

Geography and topography. Upper Volta, a landlocked plateau lying more than 300 miles north of the Gulf of Guinea, has an area of approximately 106,000 square miles. The plateau is part of the upper savannah belt of West Africa which stretches from Senegal to Nigeria. It is dry savannah in the central and most densely populated part of the country—the Mossi country—becoming sahelian in the north above Dori and more moist and verdant from Bobo-Dioulasso to the southwest border with Ivory Coast.

The land lies between 9° 30" and 15° N latitude and between 5° W and 2° E longitude. It is bounded on the west and north by Mali, northeast by Niger, south-east by Dahomey, and south by Togo, Ghana and Ivory Coast.

Population. In 1965, the total population was estimated at 4.7 million (3000 Europeans), with an average density of 42 persons per square mile. In the Mossi country of the central region the density is higher, averaging 60 persons per square mile. About 92 per cent of the population lives in rural communities—there are some 7000 villages with an average population per village of 600. The chief urban centers are: Ouagadougou (pop. 63,000), the national capital and the Mossi tribal capital; Bobo-Dioulasso (pop. 55,000), the economic and administrative center until the completion of the Mossi branch of the Abidjan-Niger railroad in 1954 and the Bobo tribal center; smaller centers are Koudougou, Ouahigouya, Kaya and Banfora.

According to a study based on a sample survey (1960-1961) covering 184,000 persons, the annual rate of increase was estimated at 2 per cent, corresponding to the doubling of the population in 38 years; the birth rate was estimated at 49.1 per 1000 inhabitants per annum and the infant mortality at 174 per 1000 live births.

Based on a growth rate of 2 per cent per annum, the total population by 1985 would reach 7,140,000, the school-age population (6-14 years of age) 1,577,000, and the active male population (15-59 years of age) 1,896,000.

Government. Prior to achieving national independence on August 5, 1960, Upper Volta had little more than a decade of continuous experience as a separate territory of French West Africa. From 1932 to 1947, the largest and most populous regions were administered as a part of Ivory Coast territory, with other parts belonging to the Soudan (Mali) and Niger.

The form of government under the constitution is presidential within the framework of separation of powers. Maurice Yameogo was elected president for a five-year term in December 1960 and re-elected to a second term in October 1965. However, in early January 1966, when a general strike was called and public demonstrations made against the government's austerity program, Yameogo declared

a nationwide state of emergency and quit. He has been succeeded as "chief of state" by Lt. Col. Sangoule Lamizana, Army Chief of Staff. Lamizana announced that his government would respect all agreements Upper Volta had previously made with other countries.

Administratively, the country is divided into five départements, each headed by a prefect. These départements and their chief towns are: Centre (Ouagadougou), Est (Fada-N'Gourma), Volta Noire (Koudougou), Hauts Bassins (Bobo-Dioulasso), and Sahel (Ouahigouya). The départements are subdivided into 40 arrondissements.

Upper Volta was a founding member of the Conseil de l'Entente (see page 24). With Ivory Coast, Upper Volta jointly administers the Abidjan-Niger Railroad and the port of Abidjan.

Upper Volta is a member of the United Nations and its specialized agencies and an associate member of the European Economic Community; it is also a member of OAU, OCAM, and the West African customs and monetary unions. Ouagadougou, the capital, is the seat of the UAM Defense Council which promotes cooperation among the 14 member states in training of troops, standardization of equipment, and collective security.

Education. In 1964, there were 518 elementary schools with 79,210 students and 300 rural centers with 15,000 students, or a total of 818 elementary schools with 94,210 students. There were 25 secondary schools with 4707 students, and 10 technical schools with 789 students. For professional training at university level students must go abroad. In 1963-1964, there were 302 students at foreign universities or superior schools: 243 in France, 36 at Dakar, 23 at Abidjan. Also studying abroad were 87 students doing secondary school work preparatory to technical training and 27 doing secondary school work preparatory to professional training.

Primary and secondary school enrollments trebled between 1957 and 1964, but the rate of school-age children in school increased only from 9 to 10.5 per cent. By 1975 full enrollment is expected to be achieved.

The most encouraging aspect of education in Upper Volta is the emergence of a rural school system. Until a few years ago schools existed only in the large towns; now schools (300 to date) are being opened in rural areas, for instance, near the sites of the new dams, creating a rapid expansion of school facilities.

The education budget in 1963 totalled \$6.9 million, or 20 per cent of the cost of central government operating expenses, and a per capita investment of \$1.55.

More than 200 French teachers and administrative officers, most of them under the technical assistance program, work in education in Upper Volta.

ECONOMIC RESOURCES

The economy of Upper Volta is based principally on subsistence agriculture. Its gross national product is estimated at between \$205-\$209 million, with a per capita income of \$45, circa 1963. The intermediate plan for the period 1963-1964 provided for an outlay of \$66 million, of which 41 per cent was for agriculture.

Agricultural products comprise 69 per cent of the GNP. Livestock, the principal wealth of Upper Volta, is estimated at 2 million cattle, 3 million sheep and goats, and sizeable numbers of horses, asses and pigs. Leading food crops are sorghum, millet, peanuts and maize. Cotton, a relative newcomer, is being grown with increasing success. Rice has been introduced in swamps of the southwest, but the cost of production still exceeds the price of imported rice.

It is estimated that less than 10 per cent of the land is tilled. Some of the most fertile land has been unused because of disease or flooding. Strips up to 12 miles along the banks of the three Volta Rivers—the Black, the Red, and the White—and the Bougouriba are uninhabitable because of flooding and, until recently, the danger of sleeping sickness. Portions of the Fada-N'Gourma district, the valleys of the Red and White Voltas, and areas along the Black Volta and the Bougouriba Rivers are uninhabited because of blindness due to onchocerciasis.

Primarily for lack of arable land, nearly half a million Voltaics are seasonal workers in the more productive coastal regions—principally in Ivory Coast, Ghana, Dahomey and Nigeria.

Central to the country's development is the need for water. An extensive irrigation system from barrages and deep wells is a necessity because the thin, rocky soil cannot utilize the rainfall it receives. For upper savannah lands, Upper Volta has good rainfall, but in the prevailing Pre-Cambrian rock based soils, rains do not penetrate, leading to fast runoff, erosion and flooding, whereas in the lesser sandstone based areas, rains percolate too rapidly, creating a deep water table that is difficult and expensive to drill into.

Land and water resources of many areas are sufficient only for grazing. This has led to the development of large herds above the tsetse belt—the area roughly north of a line from Ouahigouya to Kaya to Fada-N'Gourma. Overgrazing contributes to erosion and the problem is accentuated by the passage of large herds from Mali, en route to Ghana and the Ivory Coast. The cattle walk a distance of 700-1000 miles on their way down to the meat markets of coastal towns. Almost inevitably they become infected with trypanosomiasis on the way, though the veterinary services are making great efforts to give chemoprophylaxis. Twenty per cent of cattle slaughtered at Bobo-Dioulasso abattoir show evidence of tuberculosis.

Industrial production comprises 3.8 per cent of the GNP or a value of \$2.025 million. The industry, centered mainly around Bobo-Dioulasso and Ouagadougou, is developing naturally from the processing of its agricultural products: meat processing plants, tanneries and leather factories, fat/soap manufacture from peanuts, shea nuts and sesame, cotton ginning. New plants planned or under construction include a tomato cannery, a plant to add protein to farinaceous foods, a plant to reconstitute milk, a cigarette factory, another brewery, the first textile (spinning) mill, another soap/fats plant.

The country's mineral endowment appears to be modest, although mineral prospecting is not completed. Gold averaging 20 grams to the ton is found at Poura and produces 1000-1400 kg. annually. It is the only mineral being produced at present. Good deposits of manganese have been found—a field estimated at 700,000 tons of 35 per cent grade ore at Kiere, and another, estimated at 5 million tons of 52 per cent grade at Martoye (Dori district). Bauxite is found in Kaya and Bobo-Dioulasso districts; tin in Tenkodogo, Ouagadougou and Kaya; lead at Tenkodogo; copper at Goundoudy.

Bobo-Dioulasso and Ouagadougou each have a central diesel power station, the combined output of which in 1963 amounted to 15.8 million KWH. A site on the Black Volta and the Sourou Rivers (near Dedougou) has been studied for another power plant, which could have a capacity of 25 million KWH and aid in the extension of irrigation. Upper Volta is a member of the Niger River Commission which is planning the regional development of the Niger River (see page 25).

There is an unfavorable balance of trade, the country's imports being about four times the value of its exports: for 1963, imports were valued at \$37.4 million, exports at \$9.4 million. Imports are mainly heavy equipment and related items. The major export is livestock and hides, comprising about 55 per cent of all exports, followed by dried fish, cotton, peanuts, gold, shea butter and small amounts of food grains.

NATIONAL BUDGET

In 1965, Upper Volta's estimated budget totalled \$37.2 million, of which \$35.2 was for operating expenses. Health services represented 10 per cent of the operating budget or an average per capita cost of \$0.70 (based on a population of 4.7 million).

Personnel expenses accounted for 53 per cent of the operating budget; they accounted for 72 per cent of the health budget.

The budget data for the last five years were as follows (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$35,235	\$28,481	\$3,537	12	\$.80
1962	37,472	34,040	4,124	12	.90
1963	40,199	35,203	4,862	14	1.10
1964	40,409	37,480	5,080	14	1.10
1965	37,192	35,166	3,335	10	0.70

* Based on population estimates of 4.5 million, 1961-1963, and 4.7 million, 1964-1965.

ASSISTANCE PROGRAMS

Bilateral. French investment in health activities through FAC from 1959 to February 25, 1964 totalled \$2,427,068 and was expended as follows: Ouagadougou hospital (\$771,400), Bobo-Dioulasso hospital (\$791,700), Ouahigouya hospital (223,300); rural maternity clinics (\$142,100) and campaigns against endemic diseases (\$487,200).

The U.S. AID program in FY 63 amounted to \$522,000 in technical cooperation and development grants (of which \$181,000 or 35 per cent was for health and sanitation projects); in FY 64, \$410,000 (of which \$184,000 or 45 per cent was for health and sanitation projects); and in FY 65, \$463,000 (of which \$47,000 or 10 per cent was for health and sanitation projects). (Compare with Appendix 1,

Volume I.) U.S. AID health projects included the vaccination of 800,000 children against measles, improvement of the endemic disease mobile services through ambulances and medical equipment, and contributions to the construction of buildings and dwellings for the medical center at Kaya; other AID-supported centers are at Yako and Manga. U.S. AID programs other than health include loans for well drilling, water studies, livestock improvement, and continuation of the English language program at the Ecole nationale d'administration, Ouagadougou.

U. S. surplus agricultural commodities under PL 480, Title III, have been supplied as follows: 1961: \$15,000; 1962: \$114,000; 1963: \$512,000; 1964: \$480,000; and 1965: \$237,000.

Since 1962, when accords were signed between Upper Volta and the Federal Republic of Germany, the latter has advanced a loan for the purchase of vehicles and at least \$3 million for industrial development.

Under a new agreement (August 1965), China (Taiwan) will finance a water reservoir to irrigate 100 hectares of land. She will also furnish Chinese experts to aid in completing the project.

Multilateral. From 1958 to June 30, 1964, FED credits totalled \$26.4 million for 12 projects. Of this amount, \$6.4 million was invested for health and sanitation projects (see Table 3, Volume I). More than half of this sum, \$3.8 million, related to 2 hospitals, 11 dispensaries, 3 hospital pavilions, 2 mobile X-ray trucks and 14 dispensaries for the endemic diseases. In 1966 and 1967, FED will participate in financing an onchocerciasis control project.

Under the United Nations Expanded Program of Technical Assistance, project costs in 1964 totalled \$221,627. These projects included UNTA assistance for the development of natural resources, economic surveys, community development, trade promotion and marketing, and industrial development and productivity (\$87,339); assistance by ILO for manpower organization, vocational training and survey of labor conditions and administration (\$35,602); FAO assistance for plant production and protection, animal production and health, nutrition, and statistics (\$46,331); UNESCO assistance for educational planning, rural education, and teaching materials (\$25,521); and WHO assistance for public health administration and nursing education (\$13,503). Twenty experts and technicians were furnished for these projects and seven fellowships were awarded to nationals.

In 1963, the United Nations Special Fund approved a project for a five-year program to establish and operate a polyvalent center for training cadres in the agricultural redevelopment program. The project cost nearly \$2 million. FAO furnished four experts borrowed from Israel to direct the program. The UN Special Fund also approved in 1964 a three-year program of studies of water and mineral resources, estimated to cost \$1.661 million. Water studies cover areas in the south and southeast of the country; mining studies, the area around Gaoua. The UN Special Fund will also participate in the Sourou Valley development scheme (north of Dedougou).

WHO assistance programs during 1965-1967 (see Table 19) relate to leprosy control, smallpox eradication, advisory services in public health administration, nursing education, health education, maternal and child health, environmental sanitation and fellowships.

From 1960 to 1964, UNICEF provided funds for projects related to the basic health and social services, leprosy control and education in rural areas (see Table 20).

ORGANIZATION OF HEALTH SERVICES

Public health services in Upper Volta are under the direct control of the Minister of Public Health and Population. (Recommendations for a strong directorate of public health were made by some advisers, but were not implemented during the tenure of office of Dr. Paul Lambin, a minister of outstanding abilities.) The Minister is assisted by an office which includes the bureau for planning and the office of the WHO adviser and also deals directly with maternal and child health, with health education and with the problem of training of personnel. The ministry has a technical section dealing with hospitals and departmental health and welfare services; the service of control of endemic diseases under a director; and three other services dealing with social affairs, general administration and pharmacy. The latter controls the central drug storehouse located at Bobo-Dioulasso.

Medical facilities included in 1963: 3 hospitals, at Ouagadougou (686 beds), Bobo-Dioulasso, and Ouahigouya (517 beds), and about 200 dispensaries and medical centers, including 26 medical centers, offering dispensary, maternity and hospitalization services, with 574 beds; 41 maternity dispensaries; 119 medical dispensaries, of which 57 were under the Service des grandes endemies. There were also ophthalmological dispensaries at Ouagadougou and Nouna and 12 leproseries. The total number of hospital beds, estimated at 2900, corresponds to a bed per population ratio of about 1:1620.

Mail planes which serve the smaller localities will pick up seriously ill and injured patients and fly them to hospital.

Following the reorganization of the peripheral health service in 1963, the responsibility for health and welfare services has been placed under five new regional administrations, corresponding to the five départements. Medical centers and small district hospitals have been upgraded, many dispensaries were transformed into health centers and a number of new polyvalent health centers were created.

The endemic diseases control service (Service des grandes endemies) still maintains its own structure. The country is divided into sectors, each under a medical director who controls one or more mobile units for case finding and vaccination and a number of fixed dispensaries for treatment of leprosy and sleeping sickness, served by specialized nurses. In spite of the effectiveness of the Service, it is in Upper Volta that the need for its articulation with departmental and local health services, aiming at better coordination between the static and mobile services, has been clearly demonstrated.

In 1961, there were in Upper Volta 58 physicians of whom 56 were in government service, 1 dentist, 10 pharmacists, 864 nurses (of whom 17 had the state diploma, 808 were certificated and 39 were auxiliaries) and 22 midwives and 70 assistant midwives.

Assuming that the total number of physicians is still 58, this number corresponds to a ratio of about 1 physician per 81,000 population. This proportion

does not include physicians serving under OCCGE in Bobo-Dioulasso. There were six Voltaic students of medicine at the Dakar Medical School and several in France in 1964-1965.

Schools for nurses at Bobo-Dioulasso and Ouagadougou award a local diploma. It is planned to bring these courses up to standard level, with aid in planning from a nursing education specialist provided by WHO. Nurses for the Service des grandes endemies are trained at OCCGE, Bobo-Dioulasso.

PUBLIC HEALTH PROBLEMS

The effectiveness of the Service des grandes endemies of Upper Volta and the OCCGE has checked the rise of incidence of some endemic diseases. Mass campaigns are being successfully waged against leprosy and treponematoses.

Onchocerciasis was the subject of preliminary studies with a view to evaluating the magnitude of the problem. It was estimated in 1964 that the total number of microfilaria carriers was nearly 400,000, almost 10 per cent of the country's population. The disease is hyperendemic in the area south of a line from Dedougou to Ouagadougou to Fada-N'Gourma where the infectious rate varies from 10 to 25 per cent, reaching 70 to 80 per cent in some villages. The number of cases in the area between Diébougou and the Black Volta is estimated at 100,000.

An agreement was reached recently by WHO with the governments of Ghana, Togo and Upper Volta with regard to a proposed intercountry project for the control of the Simulium fly and onchocerciasis in the Volta basin. The Sourou Valley development scheme has included a survey by a WHO epidemiologist to study the potential danger of the spread of endemic diseases in the proposed irrigation.

A regional campaign against onchocerciasis, approved by the WHO, will be executed in Ivory Coast, Upper Volta and Mali in 1966 and 1967 by the OCCGE. Of the 400,000 cases expected to be treated in this program, 200,000 are estimated to be in Upper Volta, 150,000 in Ivory Coast and 50,000 in Mali. In late 1965, FED approved a subvention of \$734,000 for this program; earlier surveys were financed by FAC.

Trypanosomiasis, once widespread is now under control; there were only 313 new cases in 1964. There were depopulating epidemics of trypanosomiasis along the courses of the Black Volta and Bougouriba in the 1890's and again in the 1930's. This area continues to be a potential epidemic focus, needing constant surveillance. Migrant laborers and cola traders returning from Ghana pass through endemic foci of trypanosomiasis in the Ashanti forest, and thus fresh infections tend to be introduced.

Smallpox continues to decrease—from 2360 cases and 341 deaths in 1961 to 8 cases and no deaths in 1964. WHO has helped provide vaccine for this and other countries in connection with the eradication programs in Africa.

With 142,000 known cases of leprosy in August 1965, Upper Volta has the greatest number of cases of the French-speaking countries of West Africa; next highest is Ivory Coast with 113,000 and Mali with 95,000. Approximately a third of the cases now show no clinical signs of the disease. Leprosy control programs, with material assistance from UNICEF (1964-1965: \$57,000) and guidance from WHO, are in operation in Upper Volta. Self-treatment of leprosy with quarterly supply

of drugs and treatment by nurses visiting patients on bicycles were experimented with in Upper Volta (about 9000 cases in 1964).

Trachoma is endemic in the northern half of the country; the incidence reaches 5 to 10 per cent of the population, the total number of cases being estimated at 700,000. Among these there are at least 70,000 cases with trichiasis. The situation would require an intensification of treatment, surgical intervention and health education.

More than 800,000 children were immunized against measles in the campaign sponsored by U.S. AID. Recent data show the dramatic drop in incidence. In 1962, there were 27,797 cases and 1021 deaths; in 1964, 3439 cases and 196 deaths.

A serological survey by the Pasteur Institute to evaluate the incidence of arboviroses in West Africa has been completed. Made with the help of the Centre Muraz, this survey showed a frequency of antibody for Group A and Group B, with O'nyong-nyong in Group A. In Group B, there is antibody of yellow fever, which after two mass campaigns of vaccination brought the rate to 80 per cent, considered as protecting the population from epidemics. (See page 99.)

HEALTH DEVELOPMENT PLANS

Goals set by Upper Volta public health authorities under the prospective development plan are many: increased numbers of qualified hospital staff; development of secondary centers, so that most cases may be given care, both medical and surgical, in situ; intensified prospection and campaigns in the bush; carrying out a general health education plan of environmental sanitation. The onchocerciasis problem will require increasing efforts and financial resources.

Table 19

Estimated WHO Commitments in Upper Volta, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Leprosy control	-	-	-	\$ 1,200	\$ -	\$ -
Public Health Administration: advisory services	1	1	1	13,548	17,988	20,032
Nursing education	3	3	2	25,641	42,188	29,981
Fellowships (nursing)	-	-	-	4,000	-	-
Health education	1	1	1	9,386	15,348	21,356
Maternal and child health	1	1	2	5,385	15,159	29,104
Environmental sanitation	-	-	1	-	-	17,675
Fellowships	=	=	=	-	4,000	-
Total	<u>6</u>	<u>6</u>	<u>7</u>	<u>\$ 59,160</u>	<u>\$ 94,683</u>	<u>\$ 118,148</u>
Other obligations				\$ 78,500	\$ 72,000	\$ 70,000

PUBLIC HEALTH ADMINISTRATION: Advisory services (1961-1963) (1965-1967). To assist in organizing health services and to establish a plan for their development in coordination with the socio-economic plan, paying special attention to training of staff.

This project came to an end in 1963 but is now reinstated in the program. The assignment of the former public health adviser to the project has led the Government to draw up a draft plan for the development of social and health services in the Republic and to seek assistance from UNICEF for equipment and for training of staff.

As the Government considers the assignment of a public health administrator essential, he was recruited and took up his duties in August 1965.

NURSING EDUCATION (1962-1968). To continue assistance for the development of nursing and midwifery education.

HEALTH EDUCATION (- 1968). To assist the establishment of a health education service and the training of health and other personnel in health education methods and to cooperate with the Centre Muraz, the Ecole Jamot at Bobo-Dioulasso.

MATERNAL AND CHILD HEALTH (- 1970).* To assist the development of maternal and child health services within the framework of an over-all health plan and to help in the training of auxiliaries.

ENVIRONMENTAL SANITATION (- 1970). To help in organizing the environmental sanitation services and to train national personnel.

OTHER WHO PROJECTS

SMALLPOX ERADICATION (1961-1966). To assist the Government in its smallpox eradication campaign.

During the period under review, a total of 450,000 doses of freeze-dried smallpox vaccine gifted through WHO were supplied to this project. A visit to Upper Volta by the newly appointed smallpox inter-country adviser is envisaged in the near future to assess the progress of the project and to assist the Government with the drafting of a plan of operations to cover further supply operations.

* This project receives UNICEF assistance.

Table 20

UNICEF-Aided Projects in Upper Volta, 1960-1964

Total allocation: \$444,000

	Approved 1960-64
BASIC HEALTH AND SOCIAL SERVICES	\$ 175,100
	Additional commitment 91,000

UNICEF provided clinical and ward equipment for the maternity and pediatric departments of the general hospital in Ouagadougou, teaching and demonstration equipment for the main maternal and child health center and its associated training school for nurses and midwives, basic equipment and food; demonstration equipment for MCH activities, midwifery kits and kits for traditional birth attendants, vehicles, drugs and milk.

UNICEF is providing teaching equipment for the nursing school, equipment for 9 district hospitals, 75 rural health centers and 2 mobile health education units and transport for field training and for continuation of leprosy control work. WHO is providing a public health adviser, health education expert and a senior nurse-tutor.

In connection with a social center at Gaoua training girls for village leaders and teachers of handicrafts, UNICEF provided audio-visual materials, equipment, whole milk, fellowships, stipends and the salary of a social worker.

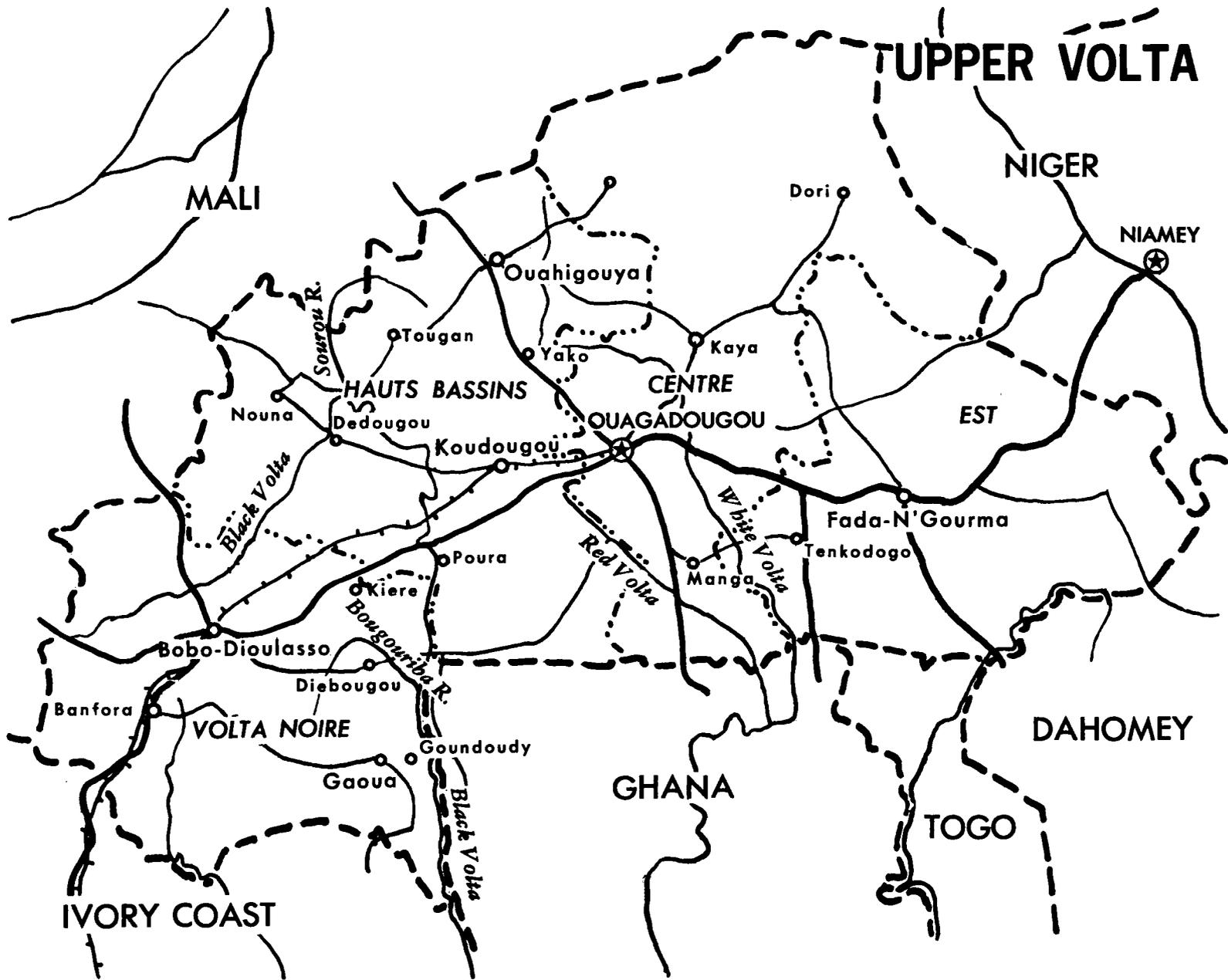
	Approved 1960
LEPROSY CONTROL	\$ 142,700

UNICEF provided drugs (including dapsone pills for self-treatment) vehicles and bicycles for the campaign.

	Approved 1960
EDUCATION	\$ 126,500

UNICEF has equipped 21 rural education pilot centers. In the school gardens students have obtained harvests four times larger than those of their parents, notably in cotton and rice.

UNICEF is also providing teaching materials, equipment for practical agricultural demonstrations, vehicles, funds to purchase smoked fish for school feeding. FAO is providing a nutritionist and an agricultural extensionist.



REPUBLIC OF GUINEA

Population:	3,259,000	Number of doctors:	132
Area:	95,000 sq. mi.	Doctors per population:	1:24,700
Capital:	Conakry	Hospital beds:	6843 or 1:475

GENERAL

Geography and topography. The Republic of Guinea lies on the southwestern edge of the West African bulge between 7° and 12° north of the equator. The land area covers some 95,000 square miles. To the north lies Portuguese Guinea, Senegal and Mali, to the east the Ivory Coast and to the south Liberia and Sierra Leone. On the west is the Atlantic Ocean with a coastline indented by wide estuaries and covered with mangrove swamps. A mountainous plateau extends southward from Senegal and Mali on the north into Sierra Leone, Liberia and Ivory Coast to the south. The northern part of this plateau, with altitudes averaging 3000 feet, is known as Fouta Djallon. Guinea is divided into four geographical regions: Lower Guinea or the coastal plain which is about 60 miles wide in the north, 100 miles wide in the south and less than 30 in the center; Middle Guinea or the Fouta Djallon area which covers some 24,400 square miles; Upper Guinea or the savannahs with an area of 37,300 square miles; and the Forest Region or southern Guinea covering an area of approximately 19,000 square miles. Much of the rain forest is practically uninhabited.

There are two climatic seasons in Guinea: a wet one from May through October and a dry one from December to March. The heaviest rainfall occurs in Lower Guinea around Conakry. Temperatures and humidity are relatively high except in the plateau areas and in the savannah region. The mean temperature is about 84° F.

Population. In mid-year 1962, the estimated population of Guinea was 3,259,000, although presently it is believed to be around 4 million. Assuming the annual rate of increase to be 2.5 per cent, the total population of Guinea would by 1985 reach 5,530,000, the school-age population (6 to 14 years of age) 1,316,000 and the active male population (15 to 59 years of age) 1,338,000. More than 40 per cent of the inhabitants are under 15 years of age. Based on the 1962 estimate, the average overall density was 34 persons per square mile. The most densely populated section is in the Fouta Djallon region inhabited by one third of the population, while the lowest densities are found east of Fouta Djallon in the savannah region.

The most populated administrative regions are: Labé - 271,632 inhabitants; N'Zérékoré - 251,984; Kankan - 176,000; and Conakry - 150,000. Among the less populated regions are Fria with 28,666 inhabitants and Dabola with 35,100.

About 90 per cent of the people live in rural areas or towns of less than 5000 inhabitants. The principal towns are: Conakry, the capital (113,000 inhabitants), Kankan (29,100), Kindia (25,000), Siguiri (12,700), Labé (12,500), N'Zérékoré (10,500) and Macenta (10,500).

The most important ethnic groups are the Foulas (1,020,000) concentrated in Middle Guinea; the Malinkés (850,000) in Upper Guinea; the Soussous (220,000) in Lower Guinea; and the Kissiens (160,000), the Guerzés (150,000) and the Tomas (83,000) in the Forest Region. The majority of the people are Moslems.

Government. In the French constitutional referendum of September 1958, Guinea was the only one of France's African territories which chose not to join the new French Community. It became a fully independent republic on October 2, 1958. Sekou Touré was invested as Prime Minister and in January 1961 was elected President of the Republic by universal suffrage for a seven-year term. Under its constitution of November 1958, Guinea was declared "a democratic, secular and social republic." The 75 members of the National Assembly, a unicameral body, are elected by universal suffrage for five-year terms. There is only one political party: Parti démocratique de Guinée.

Following independence, relations with France were strained. Guinea hoped to maintain cooperation with France but the latter refused and withdrew its administrative, technical and military personnel and movable equipment. In spite of this, Guinea survived under the leadership of Touré and with initial help of a loan from Ghana and financial and technical assistance from the Soviet Bloc. French remained the official language and Guinea retained the French judicial system and continued to send students to France for higher education.

In 1960, Guinea withdrew from the franc zone and adopted its own currency, the Guinean franc (FG). It could be exchanged for the CFA franc on the basis of parity. However, according to President Touré, currency was smuggled across the border to neighboring countries and sold at less than its value. To combat this, a second currency reform took place in 1963 and banknotes within the country were exchanged for new issue and all Guinean currency outside the country was declared worthless.

After an unsuccessful economic reorganization which introduced state-controlled economy, the government, realizing its over-dependence on the Soviet Bloc and their failure to supply adequate material help, adopted a more lenient policy toward the West, encouraged private enterprise and settled some of its differences with France. On May 22, 1963, Guinea signed an economic and cultural agreement with France; although it has been largely ineffectual. In the fall of 1965, however, Touré accused France and the Ivory Coast of backing plots to overthrow his government. France recalled its Ambassador from Conakry and requested the Guinean Ambassador in Paris to leave. Although the embassies were closed, neither country admitted that diplomatic relations were broken.

In March 1966, Touré, in an unprecedented move, named Kwame Nkrumah, the deposed President of Ghana, as head of state of Guinea and secretary general of the political party.

Guinea is a member of the OAU and the United Nations and its specialized agencies.

The Republic is divided into 29 or 30 administrative regions each headed by a governor. The regions are subdivided into arrondissements and village communes. In November 1964, four minister-delegates were placed in charge of the four areas of the country: Coastal region, excluding Conakry (headquarters: Kindia), Middle Guinea (Labé), Upper Guinea (Kankan) and the Forest Region (headquarters: Macenta).

Education. The withdrawal of the French teachers and administrators following independence created a crisis in the educational system of Guinea which was initially met by teachers from other African states, particularly Senegal. Some of the French teachers later returned to Guinea and, by the end of 1961, more

than 300 teachers were provided by the western countries, a few from the Soviet Union and 30 to 40 from Yugoslavia, Czechoslovakia and the UAR.

The educational program, reorganized under the Ministry of National Education, aimed at adapting it to the needs of the country. Schooling was made compulsory from ages 7 to 15, private schools were nationalized, new schools were opened and existing ones expanded, and scholarships were made available for study outside the country. It was hoped to make primary education universal by 1970.

By mid-1961, there were 420 primary schools with 84,000 pupils. By 1963-1964, attendance was increased to 188,717 in the elementary grades. During this same period, the secondary school attendance rose from 5500 to 6678 and technical school attendance from 1660 to 3465. The number of students in mid-1961 totalled 91,160, or 15 per cent of the school-age population, and in 1963-1964, the number totalled 198,860, or 25 per cent, enrollment more than doubling during this period. In 1963-1964, primary teachers numbered 4049 (all Guineans), 601 secondary teachers (mostly Guineans) and 62 teachers in higher education (mostly foreign). In October 1963, Belgium sent 47 teachers to instruct high school and vocational courses. In addition to the primary and secondary schools, there is a Polytechnic Institute, a National Secretarial School and a School of National Administration.

Since Guinea lacks the facilities for higher education and technical training, students are encouraged through scholarships to study abroad. There were more than 500 Guineans studying outside of the country in 1963, including 200 in France of whom 125 had stipends. At the University of Dakar in the 1964-1965 term, out of 86 Guinean students there were 4 in medicine and 3 in pharmacy; in 1963-1964, 23 of 105 were enrolled in the Faculty of Medicine and Pharmacy; and in 1962-1963, 16 out of 60.

ECONOMIC RESOURCES

The Three-Year Plan, initiated in July 1960, was designed to modernize and develop the economy. Emphasis was placed primarily on infrastructure and on agricultural and industrial production. A total investment of \$158 million (later increased to \$178 million) over the three-year period was envisaged with financing dependent on foreign countries. The most important loans were made by the USSR (\$73 million), Communist China and Ghana (\$24 million each), West Germany (\$16 million), Czechoslovakia and the United States (\$10 million each), Yugoslavia (\$8 million) and Poland (\$4 million). Other loans came from Hungary, East Germany, Morocco and Bulgaria. The Seven-Year Plan, introduced in 1963, called for continuing and improving the program of infrastructure, but emphasis was shifted to agricultural production and industrialization.

One of the interesting facets of the Three-Year Plan (1960-1963) was the "human investment program" which aimed at furnishing manpower for public works and agricultural projects. Able-bodied men were required to work voluntarily without compensation for 20 days each year for the three years. Roads, schools and dispensaries were built and lands cleared and trees and crops planted by this unpaid labor force. Labor, largely unskilled, was encouraged to seek training and the government provided apprentice schools to meet this problem. Wage and salary workers are employed in government, in commerce and industry and as plantation laborers. The bulk of the population, about 80 per cent, is engaged in subsistence farming. Along the coastal area, some earn their living from fishing and a small number from lumber in the forest areas. The gross national product is

estimated to be about \$270 million with a per capita income of \$85.

The Ministry of Rural Economy was set up in 1960 to improve farming, animal husbandry and forestry in accord with the Plan. Farmers and stock breeders were encouraged to form cooperatives. Much of the land is not suitable for cultivation due mainly to soil erosion. Crop diseases and poor farming methods are further handicaps to increased production. Bananas and coffee, two main export crops, are mostly cultivated on the plantations. Other cash crops include: palm nuts and kernels, pineapple, peanuts and cinchona. Citrus fruits are grown largely for local consumption. Rice is the most important food crop. Others are fonio, manioc, corn, peanuts, potatoes, yams and taro. However, food products are imported as domestic production is not adequate for the needs of the population.

The Foulahs and Malinkés, the main livestock raisers in the country, own the largest herds of cattle, sheep and goats. In the past, religion and the belief that ownership of cattle is a sign of prestige have restricted killing the livestock and these customs have not added materially to the economic life of the country. Nearly all farmers keep a small number of livestock. In 1961, West Germany sent advisers to study ways of improving cattle raising and to assist in establishing a veterinary service. In 1962, the number of livestock was estimated as 1.5 million head of cattle, 343,000 sheep and 491,000 goats.

Fish, found in the coastal waters and rivers, are an important source of food and income. Poland agreed to provide funds and assistance to develop a fishing industry and construct a fishing port at Conakry. Development of the lumber industry was hindered by shortage of labor and lack of transportation. Teak, ebony, acacia and rubber are among the most important species.

Guinea's natural resources have not been fully developed. The country has large reserves of bauxite, iron ore deposits and resources for hydroelectric power. In the past, industrial activity in Guinea was largely owned by foreign companies. Since 1953, the French have operated the iron ore mine near Conakry. European banking interests are exploiting iron ore deposits at Numba-Simandou. The largest industry is the Fria aluminum plant at Kimbo opened in July 1960 and operated by a consortium of American and European firms. The important bauxite deposits are at Iles de Los, Boké and Kimbo. Others are found at Dabola and Kindia. Diamonds and gold are an important source of income and prospecting for further deposits was undertaken. Except for a few foreign-owned mining and processing companies, such as the Fria plant, most of the existing industries are now government owned and operated.

Other than the Fria aluminum plant at Kimbo, Guinea has only a few small industries, most of which involve the processing of agricultural products and the manufacture of consumer goods. These include: a pineapple cannery, oil and soap plants, soft drinks and ice cream plant, a brewery, a plant to produce fruit juices, a quinine factory, sawmills and brickyards and factories producing explosives, paint, plastic articles and prefabricated houses. Foreign aid provided a slaughterhouse and refrigerating plant at Conakry (West Germany), a cigarette and match factory (Communist China) and a furniture factory (Yugoslavia).

Transportation facilities are poorly developed. Guinea has about 2200 miles of all-weather roads and some 4400 miles of dry season roads, most of them unpaved. A railway runs from Conakry to Kankan (410 miles). There are several

private lines which transport minerals; the most important connects Conakry with the Fria plant. The main seaport is at Conakry which is capable of handling up to 3 million tons a year. Plans for an extension of this port are under consideration. Smaller ports for coastal traffic are located at Boké, Victoria, Boffa and Taboriah. There is also a mining port at Kassa and a wharf at Benty for banana boats.

Guinea has an abundance of rivers and waterfalls but in 1961 its only hydro-electric station was located on the Konkouré River at Grandes Chutes, northeast of Conakry. This installation served Conakry and Kindia. A Yugoslavian firm completed construction of a dam at Kalé in October 1963 to supply power to Conakry and Lower Guinea. The agreement involved around \$3.5 million. With the help of a U.S. AID loan of \$1.4 million in 1965, a 7500-kw central electric plant was installed to provide more power for the area around Conakry, Coyah and Kindia. Diesel generators serve other towns. Another dam is planned for supply of electricity to towns of Fouta Djallon and Middle Guinea.

During the last few years, the value of exports has increased while imports are decreasing. Exports totalled \$45 million in 1962, \$50 million in 1963 and \$65 million in 1964. Alumina, diamonds and iron ore represent more than half of the total value of exports. Others include bananas, pineapples, coffee and palm kernels. Principal clients were France, United States, Cameroun and Poland. Imports in 1962 were valued at \$65 million, \$57 million in 1963 and \$45 million in 1964. Principal items were machinery, vehicles, cement, petroleum products, cotton textiles, rice and sugar. The United States supplied food under PL-480. The main suppliers were the U.S., USSR and Communist China.

NATIONAL BUDGET

Details of the national budget of Guinea were not obtainable. According to one available source,* the health budget for 1961 was about \$5.5 million or 16 per cent of the national budget. Total budgets were as follows (in thousands):

1961	\$35,434	1964	\$54,100
1962	36,467	1965	72,872
1963	47,455		

In the 1965 budget, health services accounted for 8.2 per cent of the total. This, however, does not include the operating cost of hospitals which benefit from a special government subsidy: about \$1.3 million in 1965.

Under the \$158 million budget for the Three-Year Plan (1960-1963) social services were allocated \$25 million. Of this amount, public health accounted for \$7 million and education for \$14.9 million.

ASSISTANCE PROGRAMS

Bilateral. United States aid to Guinea began in 1960 with the signing of an economic agreement providing for U.S. technical and economic assistance. Under the Food for Peace program, the U.S. made available, from 1962 through 1965, credits amounting to \$25 million to finance economic development projects within Guinea.

*Special Warfare Area Handbook for Guinea. Special Operations Research Office, Washington, D.C., December 1961.

Volunteers of the Peace Corps first arrived in Guinea in 1963. As of July 1965, this group numbered 69. An agricultural school, set up at Tolo near Mamou and supported by U.S. AID, is staffed by these volunteers and Guineans. Other workers have improved and repaired irrigation systems and assisted in agricultural and poultry projects. Peace Corps teachers made up about 60 per cent of the English teachers. Social assistants help in the maternity clinics.

Technical cooperation and development grants from U.S. AID involved the fields of agriculture, industry and mining, transportation and education. These amounts totalled \$3.6 million in FY 63; \$2.7 million in FY 64; and \$4.6 million in FY 65. No amount was allotted for the special category of health and sanitation for these years. However, Guinea was one of the six African countries included in the AID regional program for measles control concluded in FY 65. Development loans amounted to \$2.4 million in both FY 63 and FY 65. Some projects considered for the future involve a leprosy center, a research institute, housing for teachers, development of the tuna industry and plans for construction of a hotel.

At the request of the Guinean government, the hospital ship HOPE, staffed by some 120 Americans, remained at Conakry from October 15, 1964 until the fall of 1965. The mission provided an opportunity for the U.S. professional health personnel to exchange medical information with the health personnel of Guinea. Besides operating outpatient clinics in the two hospitals in Conakry and in-patient service aboard ship, the personnel of the project HOPE furnished post-graduate medical education to Guinean physicians, trained paramedical and technical personnel in relation to patient care and hospital operations and helped in the improvement of nursing techniques. Lectures, conferences and seminars were held and health educational programs established.

The USSR, one of the first to aid Guinea after independence, granted long-term loans totalling about \$250 million (estimated) and provided a number of technicians to help carry out various projects. Some of these included a canned food factory, improvement to the Conakry airport, a hotel in Conakry, the Polytechnic Institute, reopening diamond mines, equipment for the 500-bed hospital at Conakry, construction of an experimental farm at Ditinn and the building of several dairy farms. The USSR also agreed to aid with the dam on the Konkouré for installation of a hydroelectric plant and an alumina factory, to furnish two modern fishing boats and eight medium-sized trawlers, to build a glass factory and assist in agricultural development.

West Germany provided grants and technicians to help build plants for processing and refrigerating fish, advised in improvement of animal husbandry and veterinary science and public health practices. An agreement was made to build a laboratory for production of animal vaccines. Training is also provided for Guineans in Germany. A long-term loan was made for \$12.5 million pertaining to railroads and the water supply for Conakry. In 1962, a contract was signed with a group of West German firms to provide a water system including a 50 mile conduit providing 40,000 cubic meters per day and a purification plant at Conakry. The total investment was estimated at \$10 million, \$8 million of which was a loan from West Germany. It also assisted in the construction of the slaughterhouse and refrigeration plant at Conakry which represented an investment of \$820,500. Technical assistance to the Guinean armed forces provided for the realization of an industrial complex which included factories for shoes and clothing, a tannery, a mechanical repair shop and two mobile sawmills.

Under an economic agreement (1964), the UAR extended the expiration date of a \$17.5 million loan which involved establishing cotton and sugar plantations, irrigation schemes, school and road building, new factories and improving the port of Conakry.

Communist China made long-term loans, sent technicians and experts (especially for rice culture) and provided training for Guineans in China. Czechoslovakia made a loan of \$10 million to purchase arms and to construct a shoe factory. It also furnished 100 railway trucks and equipment for civil aviation and provided specialists. Yugoslavia granted loans and aided in industry, mining and housing. The Yugoslavs will also build the Banea dam near Kindia and a hydroelectric plant at Donka. Hungary and East Germany sent technicians and experts. Rumania provided scholarships and teachers. Mongolia donated medical equipment.

In addition to the above, Guinea had technical cooperation agreements with Bulgaria (1963), Italy (1964), Switzerland (1962 and 1964) and Tunisia (1964).

Multilateral. Project costs of the United Nations Expanded Program of Technical Assistance for Guinea in 1964 totalled \$475,305. Some of these projects included assistance from UNCTA for industrial and natural resources development and power (\$13,293); from ILO for productivity and management development, small-scale industry, social security, labor conditions and administration and manpower organization (\$45,553); from FAO for animal and plant production, rural institutions and services and forestry development (\$76,046); from UNESCO for education and teacher training, mass communication and conservation of natural resources (\$51,878); and from WHO for maternal and child health, environmental sanitation, public health administration and nutrition (\$67,091). Nineteen experts were involved in these projects and 84 fellowships were awarded nationals.

In January 1966, the Governing Council of the UN Development Program/Special Fund approved a project to assist Guinea in strengthening and improving agricultural teaching at the National Agricultural School, opened in 1961, at Kindia to meet the needs of the Government-sponsored agricultural and rural development program. The six-year project is jointly financed by the UN Special Fund (\$1,886,500) and the government of Guinea (\$1,833,000) and will be executed by FAO. It is hoped eventually to increase the enrollment from 95 students (1966) to 250 by reorganizing the curriculum, developing research programs and enlarging the buildings. It is also planned to have an experimental farm adjoining the school for practical training. The UN will provide personnel, fellowships, equipment and teaching materials.

The World Bank agreed to loans for infrastructure (port and railroad) in connection with the bauxite deposits at Boké.

The WHO program for Guinea in 1965 related to the development of a network of basic health services as a part of the malaria pre-eradication program, public health services, maternal and child health services, environmental sanitation and fellowships at an estimated cost of \$91,226 in addition to \$61,000 from extra budgetary funds (see Table 21).

UNICEF provided funds for projects relating to a maternity hospital, the nurses' and midwives' school, maternal and child health centers, a pilot sanitation zone and leprosy control (see Table 22).

ORGANIZATION OF HEALTH SERVICES

The Ministry of Public Health and Population deals with health and medical activities and with social affairs. The Minister (Diallo Alpha Amadou) is assisted by a Secretary of State (M^{me} Camara Loffo) presumably in charge of social affairs. The Ministry has eight departments of which one deals with social affairs. Others include that of the inspector general of medical and health services, the department of public (and social) hygiene, endemic disease control service (Service national de lutte contre les grandes endemies, director: Dr. Bangara-Alecaut) and departments dealing with maternal and child health, inspection of pharmacies and training schools. A new division dealing with environmental sanitation is being set up within the Ministry.

The Ministry aims to improve the health services by creating additional regional hospitals, dispensaries, maternity clinics and maternal and child health centers in both urban and rural areas; to train technicians in public health; and to educate the populace in sanitary practices. Emphasis is placed on preventive medicine. The public health services are being reorganized with the assistance of a WHO public health adviser (see Table 21).

The country is divided into 29 medical regions each including a medical care service, an endemic diseases sector and maternal and child health service. The medical care service generally includes a dispensary, a pharmacy, hospital service with minor surgery and maternity care.

The Endemic Diseases Control Service has four regional offices located in Dubreka, Mamou, Kankan and N'Zérékoré. Through its mobile units, the Service carries out vaccination programs and diagnosis and treatment of trypanosomiasis, leprosy, onchocerciasis, syphilis and yaws. It collaborates actively with the OCCGE. In August 1965, the Minister stated that "Guinea participates in some of the regional projects of OCCGE but is not a formal member of the Organization." The personnel includes 5 physicians, 191 nurses, 4 nurse specialists, 46 nurses aides, 59 sanitary technical assistants and 223 other workers.

Health facilities include 21 hospitals (4 regional and 17 secondary), 158 dispensaries and 1 anti-tuberculosis dispensary, 18 maternity clinics, 36 maternal and child health centers and 23 leprosaria and sleeping sickness treatment centers. In 1963, there were 5843 hospital beds (900 in Conakry and 5943 in administrative regions), with a bed ratio of 1:475 inhabitants.

Conakry has two hospitals. Construction of the five-story Donka Hospital (500 beds) was started by the French and completed by the Guineans under the direction of a Polish architect. General medical, surgical and pediatric wards are in the main building while the obstetrics ward is located in a separate building. A small laboratory is attached to the hospital where simple hematology and urine analysis tests are made. The Ballay Hospital with 250 beds is a two-story pavilion type construction containing medical, obstetric-gynecology, pulmonary disease and surgical wards as well as two operating rooms, two radiology units and a small laboratory. The Annex, constructed in 1961, consists of an operating room suite and surgical wards with 78 beds. Under a decree of February 1964, payment is now required at the Ballay and Donka Hospitals in Conakry and also at the hospitals in Kankan and Labé.

The Fria Hospital (40 beds) in Kimbo is operated for employees of the Fria plant but occasionally takes patients referred from outside.

In 1964, medical and paramedical personnel included 132 physicians (about 80 of whom were Guineans), 11 dentists, 7 pharmacists, 1184 nurses and 83 midwives. Based on an estimated population figure of 3.259 million, the doctor ratio would be about 1:24,700 persons. Most of the foreign physicians came from Communist countries.

The National Institute of Hygiene trains sanitary technicians, promotes mass hygiene education and conducts special campaigns.

Since Guinea has no medical school, Guinean doctors were trained in the past mostly in France or at the Dakar Medical School where in 1964-1965, there were 7 Guinean students. About 30 prospective students in medicine and biology were transferred to the Algiers University after a brief attempt to study in the United States. There are two schools of nursing, one of which leads to the State diploma. The school for midwives, offering a three-year course, was opened in 1959 in Conakry. In addition, there is a school for auxiliary social workers. The school for laboratory and pharmacy assistants, set up in 1963, offers courses in bacteriology, chemistry, parasitology and anatomy. The school of sanitation, set up with WHO assistance, has at present a three-year program, the first two years in common with the nursing students and one year of specialization in sanitation. A pilot demonstration zone for sanitation work was established at Coyah. With the help of a WHO adviser, the various schools were reorganized into a single school of Public Health during the 1963-1964 school year. It has been stated unofficially that Guinea is planning to set up a school for medical assistants (médécins intermédiaires) with a four- or five-year program and is hoping to enlist assistance from Switzerland for this project.

In January 1965, the Guinean government took over the former Pasteur Institute of Guinea (located at Pastoria 4 miles from Kindia and 90 miles from Conakry) and set up a new institute of applied biology (Institut de recherches et de biologie appliquée de Guinée, IRBAG) with Dr. Camara Thiécouré as director. The new director hopes to enlist the assistance of the Pasteur Institute of Paris for a research and teaching program. As is known, the Pasteur Institute, created in 1923, was a branch of the Institute in Paris. In addition to its work on vaccines, it served as a collecting center for monkeys and snake venoms. The Pasteur Institute in Paris withdrew its support at the end of 1964. The revival of the new institute will be difficult owing to the lack of trained personnel, modern equipment and other difficulties resulting from the isolated location.

PUBLIC HEALTH PROBLEMS

Among the disease problems of Guinea, malaria, onchocerciasis, tuberculosis and measles are the most important; the trypanosomiasis situation requires continuous vigilance; leprosy incidence is high and regular treatment of known cases is probably inadequate; smallpox in spite of recent campaigns continues to be a problem.

Malaria endemicity follows its usual West African pattern: mesoendemic in Conakry and other coastal areas and holoendemic elsewhere. A WHO program, initiated in 1965, includes a general survey of malaria epidemiology (see Table 21).

Onchocerciasis occurs principally in the east (regions of Kouroussa, Kankan, Siguiri, Dabola and Faranah) where there are foci, some hyperendemic, in relation to the Niger River and its tributaries. In the west, a focus in the Gaoual area is continuous with one in Senegal. The infection rate varies from 16 to 90 per cent. The disease is causing concern to the government as well as to health authorities, since it is depopulating potentially rich farming areas.

Tuberculosis is stated by French observers to be a serious health problem.

There is evidence of the disease spreading and a steady rise has been noted among school children in Conakry. Measles (and its complications) is probably the greatest killer among children. An immunization campaign, initiated in December 1964, covered by the end of 1965 only about 76,000 vaccinations.

Sleeping sickness was violently epidemic in Guinea during the 1930's. The border area where Guinea, Sierra Leone and Liberia meet is recognized as one of the potentially most dangerous foci of the disease. The danger in this area (where the Kissi people move freely across frontiers) was pointed out in 1962, when the first meeting of the WHO Expert Committee on Trypanosomiasis was held. In 1964, the area was investigated and reported on by an international team, financed by U.S. AID. They found that the majority of cases are occurring at present in Sierra Leone and Liberia. None the less, the old focus in Guinea is threatened with revival. Much of the area is in thick forest, which precludes tsetse control by tree clearing and offers great difficulties to insecticidal campaigns. There are other formerly epidemic foci in Guinea; less than a thousand new cases are diagnosed annually (in about one and a half million examinations).

Yaws used to be hyperendemic in the east close to the border with the Ivory Coast. Among some 1,468,000 examined (1959-1962), 29,000 were found to be active yaws cases. Recent resurvey data are not available but only 1257 cases were diagnosed in 1964. Leprosy cases registered at the end of 1964 numbered 64,083; of these 20,298 were under treatment, 12,400 under regular treatment and 5466 under self-treatment. The large number of persons not receiving regular treatment was ascribed (by UNICEF) to the poor condition of many vehicles of the mobile units.

Smallpox cases notified in the country rose from 96 in 1961 to 2948 in 1962; there were 55 cases in 1965 and the presence of the disease was reported early in 1966 in two coastal regions. Some 428,000 vaccinations were performed in 1964. Guinea requested WHO and UNICEF assistance in the production of lyophilized smallpox vaccine. As far as is known, this request has not been acted upon.

Yellow fever is a potential danger to Guinea. The last case was recorded in 1952 at Koundara on the boundary with Portuguese Guinea. The recent presence of yellow fever in the latter territory confirms that vaccination and disinsectization in towns and villages of Guinea is fully justified.

* * * *

Guinea's efforts for the extension of peripheral health services and maternal and child health centers and for the training of paramedical and sanitary personnel are noteworthy. Great importance is attached to health education of the masses and technical guidance in health matters of the administrators and local leaders.

In view of the special political orientation of the country and its reliance on assistance from many sources, its progress is of general interest and constructive contribution to their training programs deserves consideration.

Table 21

Estimated WHO Commitments in Guinea, 1965-1967

Project	Number of Posts			Estimated Obligations		
	1965	1966	1967	1965	1966	1967
Malaria pre-eradication program	3	3	3	\$ 18,515	\$ 42,643	\$ 48,586
Public health services	1	1	1	16,867	15,651	18,370
Nursing education	-	-	-	-	-	14,889
Fellowships (nursing)	-	-	-	4,000	4,000	4,000
Maternal and child health services	2	2	1	29,374	35,219	19,867
Environmental sanitation	1	1	2	18,470	16,562	32,142
Fellowships (environmental health)	-	-	-	4,000	-	-
Fellowships	=	=	=	-	4,000	4,000
Total	<u>7</u>	<u>7</u>	<u>8</u>	<u>\$ 91,226</u>	<u>\$118,075</u>	<u>\$141,854</u>
Other obligations				\$ 61,000	\$ 85,000	\$ 85,000
Total estimated Government Contribution				179,592	179,592	179,592

MALARIA PRE-ERADICATION PROGRAM (1965-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Guinea can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

PUBLIC HEALTH SERVICES (July 1964-1968). To assist in the reorganization of public health services after analyzing their cost and efficiency and to establish a 5-10 year plan for their development, which would be included in the over-all national socio-economic plan.

The public health adviser arrived at Conakry in July 1964 and began the first phase of the project objectives, namely, to analyze the existing facilities, the efficiency of the health services and to propose ways and means for their economic administration.

In order to establish a development plan applicable throughout the entire Republic, the public health adviser toured the country and it is hoped that soon he will be able to provide essential data for achieving the general aims of the project.

NURSING EDUCATION. To advise and assist the Government in all matters concerning the development of the basic programs for the preparation of midwives and nursing personnel at all levels.

MATERNAL AND CHILD HEALTH SERVICES (1961-1968).* To continue assistance to augment training facilities for the formation of national health staff and to expand basic maternal and child health services, particularly in rural areas.

Training activities continued. The WHO medical officer participated in a seminar dealing with the training of paramedical personnel held in Conakry in November 1964.

The public health nurse educator has been actively concerned with the organization and carrying out of courses for existing nursing personnel, student nurses and midwives in the maternal and child health services. She also has given advice regarding staff functions and the development of a planned program of health education at health centers.

ENVIRONMENTAL SANITATION (1960-1968).* To train sanitation personnel; to plan an environmental health unit within the Ministry of Health; to develop a nationwide sanitation program starting with a pilot demonstration area and giving special attention to water supply program.

Of the 17 second-year student health nurses, 16 successfully passed the final examination in 1964 and have started work for the Division of Environmental Health. Owing to recent changes in the educational system in Guinea, the courses for student health nurses were interrupted during the study year 1964/1965. The new training covers two years in common with the nursing students and afterwards one year of specialization in sanitation. Work in the demonstration zone of Coyah has continued with the construction of several masonry wells and public latrines. The WHO engineer visited several villages in order to determine the possibilities for constructing water distribution systems in the rural areas or to improve the existing systems.

OTHER WHO PROJECTS

ONCHOCERCIASIS CONTROL (1964). To assist in evaluating the onchocerciasis problem and to promote a control program.

A WHO consultant specialist visited the Republic of Guinea in November/December 1964 to assess the onchocerciasis problem. In his report he underlines the necessity to undertake future control measures on the basis of an inter-country project in view of the fact that the main foci are to be found in an area situated on both sides of the national boundary between Guinea and Portuguese Guinea (River Corubal and its tributaries). Further surveys to establish

*This project receives UNICEF assistance.

the exact locations of the main simulium breeding places will have to be undertaken before realistic plans for a control project can be drawn up.

NUTRITION SURVEYS (1964). To assist the Government to evaluate the nutritional situation in Guinea over a period of three months, from the beginning of June to the end of August 1964.

Somatometric and clinical surveys have been undertaken as well as special studies on the feeding of the young child at the time of weaning. The report of the consultant recommends the establishment of a nutritional education program to be organized principally in the maternal and child health centers.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular budget was allocated by MESA for the years 1965 to 1967 successively \$4000, \$4000 and \$4000.

Table 22

UNICEF-Aided Projects in Guinea, 1960-1964

Total allocation: \$354,000

MATERNAL AND CHILD HEALTH (MCH)	Approved 1960-64 \$ 62,000
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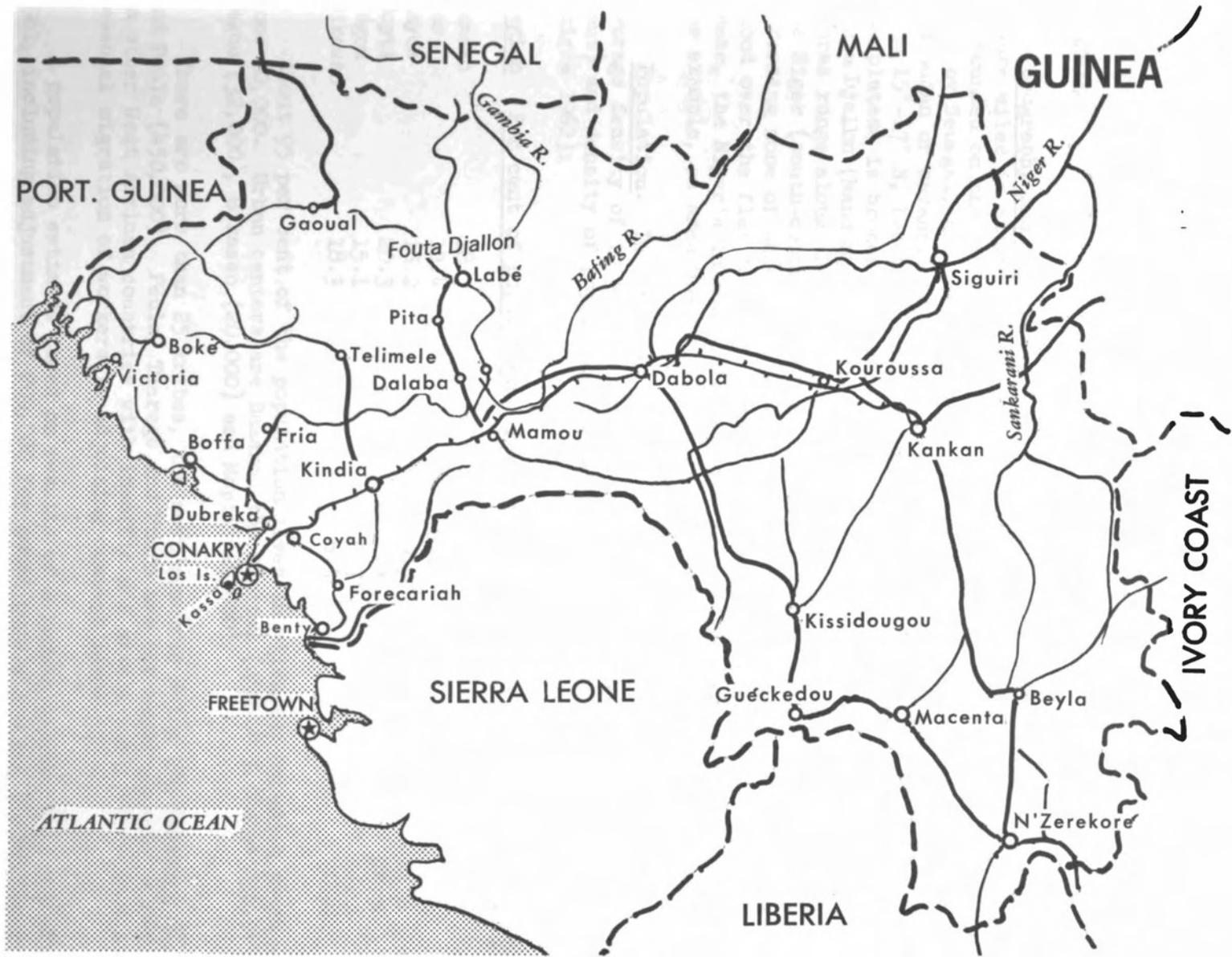
UNICEF provided basic and training equipment for a maternity hospital and its nurses' and midwives' school and a school for auxiliary social workers; also equipment for 10 primary, 20 secondary and 65 tertiary MCH centers.

ENVIRONMENTAL SANITATION	Approved 1961 \$ 47,100
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UNICEF is providing equipment for training, for laboratory and for well construction; vehicles and stipends for the sanitation personnel training program.

LEPROSY CONTROL	Approved 1960-64 \$ 117,700
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UNICEF provided sulfone drugs and transport for leprosy control beginning with a two-year campaign with the help of a WHO consultant. Additional vehicles were provided to ameliorate transport difficulties.



REPUBLIC OF MALI

Population: 4.6 million	Number of doctors: 103: 60 national +	
Area: 465,000 sq. mi.		43 foreign
Capital: Bamako	Doctors per population: 1:45,000 (total)	
		1:77,000 (nationals)
	Hospital beds: 3400 or 1:1350	

GENERAL

Geography and topography. Mali is a hot, dry, landlocked plateau, 465,000 square miles in extent. Lying at 10°-26° N latitude and 4°-12° W longitude, it is bounded on the east by Niger, south by Upper Volta, Ivory Coast and Guinea, west by Senegal, and north by Mauritania and Algeria. In general, savannah climate and sudan or savannah vegetation occur up to 15° N; sahel climate and vegetation from 15°-17° N, becoming semi-Saharan from 17°-19° N and Saharan above 19° N. The plateau is broken by several hills, mesas and scarps, including a spur of the Fouta Djallon (Manding Mountains) extending eastward to Bamako and the Adrar des Iforas range along the northeast border. The two longest rivers in West Africa, the Niger (south-central Mali) and the Senegal-Bafing (southwest Mali) sustain a farming zone of about 80,000 square miles. During the rainy season the rivers flood over the flat land, creating great areas of surface water. The largest of these, the Niger's inland delta, extends from Ségou to Timbuktu. At Diafarabé, for example, an area 60-100 miles wide is flooded from September to January.

Population. In 1965, the population is estimated to be 4.6 million, with an average density of 10 persons per square mile. Land area and population (in per cent) and density of population in the six administrative regions are as follows: (circa 1962):

<u>Region</u>	<u>Per cent of population</u>	<u>Per cent of land area</u>	<u>Density per square mile</u>
Bamako	18.7	7.5	23.0
Gao	12.4	64.2	1.8
Kayes	15.2	9.9	14.2
Mopti	20.3	7.4	25.3
Ségou	15.1	4.7	30.0
Sikasso	18.3	6.3	26.9

About 95 per cent of the population lives in villages, of which there are some 10,000. Urban centers are Bamako, the capital (150,000), Kayes (32,000), Segou (32,000), Sikasso (20,000) and Mopti (15,000).

There are more than 25 tribes, the most numerous being the Bambaras (1,400,000) and Peuls (450,000). Peuls, Tuaregs and Moors are the major nomadic tribes. As in other West African countries with insufficient arable land, there is a sizeable seasonal migration of workers to adjoining coastal lands.

A population estimate based on results of a sample survey, June 1960-May 1961, including adjustment of 209,000 for nomad population and 33,000 for persons in the zone controlled by Office du Niger, not covered by the survey, was 4,100,000. At an annual rate of increase of 2.4 per cent the population by 1985 would be

6,600,000; the school-age population (6-14 years of age) 1,550,000 and the active male population (15-59 years of age) 1,670,000. These estimates are probably too low; more recently the annual rate of increase was stated to be 2.7 per cent.

Government. As the Soudanese Republic, Mali joined the French Community in September 1958 and in 1959 with Senegal founded the short-lived Federation of Mali, which ended when Senegal withdrew in August 1960. The independent Republic of Mali was proclaimed September 22, 1960, and Modibo Keita, who had been president of the Federation of Mali and head of Mali's single political party, the socialist Union Soudanaise, became head of government and chief of state. From 1960 to 1962, the government was confronted with formidable problems: An intra-party quarrel over the degree of socialism to be undertaken rent the party. The closing of the Dakar-Niger railway by Senegal forced heavy investment in motor transport and higher freight rates via rail to Abidjan and Cotonou. Strict regulation of production, prices, and transfers of capital and profits of private firms by the socialist government brought riots and flights of capital (CFA franc) and required the adoption of a strictly regulated national currency, the Malian franc (FM) (see page 17). In 1962, however, the party quarrel was settled, and with aid from the French, mainly, and from the Sino-Soviet bloc, the government has proceeded with a moderate domestic program of socialism and a policy of non-alignment abroad. In 1963, the Dakar-Niger railway was reopened when Senegal and Mali signed a treaty of cooperation covering transport, customs and currency. Treaties of mutual cooperation and assistance have also been concluded with Dahomey (1962) and Ivory Coast (1963). In February 1965 discussions were held with Guinea concerning cooperation in trade, transport, telecommunications, development and monetary matters. The two countries also agreed (in 1962) to share the projected Université de la Guinée et du Mali, whose science schools will be located at Conakry and arts schools at Bamako. Guineans can attend the Malian teachers college at Bamako, now in operation.

Mali is a member of the United Nations and its specialized agencies and an associate member of the European Economic Community; it is also a member of OAU, OCAM and the West African customs union, but is not a member of the West African monetary union. The secretariat of the regional Comité inter-états pour l'Amenagement du Fleuve Senegal, of which Mali is a member, is located at Bamako.

Mali's six administrative regions are subdivided into cercles and arrondissements. The regions and the number of their cercles are as follows: Bamako (7), Gao (Niger Bend) (9), Kayes (West) (6), Mopti (8), Ségou (Center) (5), and Sikasso (South) (7). Each region is under a governor assisted by an elected regional assembly.

Education. In 1965, the national education budget was \$5.75 million or 13.5 per cent of the central government operating budget; in the same year education also received \$3.49 million or 28 per cent of the regional budgets. About 60 per cent of national and regional education budgets are for personnel costs.

Less than 20 per cent of the population is literate, and the development program and mass literacy campaign aim at increasing adult literacy as well as attendance of school-age children in school. The rate of school-age children in school has increased from 10 per cent at the beginning of independence to 14 per cent in 1964.

About 450 new classes in primary education are organized each year. Courses in home economics, agriculture, carpentry and other trades are being added to curricula and school annexes required for these subjects—carpentry shops, forges,

laboratories, etc.—are being completed at the rate of 18 per year.

In 1962, of 1743 teachers, 580 or one third were not fully qualified. Improvements in teacher training include 10 mobile teams providing refresher courses; a first-class teachers college and pedagogical center at Bamako which, with six lesser centers (at Banakoro, Sevare, Diré, Markala, Kayes and Sikasso), accommodates 480 trainees a year; and a school for home economics teachers which trains 30 per year. For these programs, UNESCO, FAO and UNICEF provide expert personnel, equipment and 360 stipends for trainees. Recently the UN Development Program/Special Fund earmarked \$1,118,000 for a period of five years for a work-oriented Adult Literacy Project.

About 200 French serve in education under technical assistance.

In 1963-1964, there were 661 primary schools with 113,000 students; 18 secondary schools with 6322 students; and 3 technical schools with 558 students. Of 743 students attending superior schools or universities abroad in 1964, 416 were in France, 232 in Eastern Europe (mostly USSR), 71 in Africa (mostly UAR and Senegal), the remainder in other countries of West Europe or in the United States (6).

ECONOMIC RESOURCES

The gross national product for 1963 is estimated at \$285 million,* with an annual per capita income of \$65-\$70. The Five-Year Plan of 1961-1966 aimed at an annual increase of 8 per cent in productivity. Investments in the sectors of the economy were to be made as follows: 25.4 per cent - agriculture; 14 per cent - industries; 11.3 per cent - hydroelectric projects and geological research; 14.5 per cent - transport and other enterprises; 10.8 per cent - administrative and social sectors; 18 per cent - town and community planning; and 6 per cent - housing.

The most valuable component of the predominantly agricultural economy is livestock, followed by the industrial crops of peanuts and cotton. Subsistence crops are millet, maize, rice, manioc, garden vegetables and fruits. Crops must be grown in naturally watered riverine lands or in irrigated land; cattle, sheep and goats are grazed mainly in the sahel west and northwest of the Niger River and in the plain of Azaouad above Timbuktu, but in the dry season many are brought to pastures in the inland delta, the Lake Debo region and along the lacustrine reaches of the river up to Kabara.

Extensive irrigation works to create more arable land are operated by the Office du Niger and the Department of Agriculture. The Office du Niger, set up by the French in 1932, has reclaimed some 160,000 acres of the "dead delta" on the left bank of the Niger; this is about 45 per cent of the land potentially controllable from the major dam of the project at Sansanding.

The project features permanent water control through a system of canals and regrading of the land, with resettlement by colonists who are taught modern farming methods and produce good crop yields. The Department of Agriculture irrigates about 500,000 acres of riverine land by simple, temporary works to control water

* All figures relating to the economy and national budget have been converted into dollars at \$1=246.8FM (Malian franc); the export or import of Malian currency is restricted.

at the beginning and end of the flood season. The Niger Valley lands have proved too poor to grow fine Egyptian cotton, as originally planned, and less profitable American cotton, rice and sugar cane are now grown.

A flourishing fishing industry, centered at Mopti, produces about 90,000 tons annually.

Industry to process agricultural products is developing. In 1964, the Ministry of Development announced that, since 1958, an average of one factory had been completed every six months and that some 30 additional projects were under study, more than half of them to be financed by countries of the Sino-Soviet bloc. Projects completed or under construction include several rice, cotton and peanut-oil mills, three refrigerated abattoirs (Bamako, Gao, and Mopti), a textile complex and a sugar refinery at Ségou, a cannery, ceramics, cigarette and match factories. Two new French-Malian companies have recently been formed to produce radio receivers and to export meat.

Prospections have revealed no mineral deposits that could be profitably exploited at Mali's present stage of development. Salt is mined locally.

The Dakar-Niger railway is the hub of the transport system both for import and export traffic through Dakar and for local traffic between major centers of Mali, including the unnavigable stretch of the Niger River between Koulikoro and Bamako. The highway system is being improved and extended under the development program. There is still considerable river traffic on the Upper Niger most of the year.

A total of 25.46 million kilowatt hours of electricity were produced by seven plants in 1964. A new hydroelectric plant is under construction at Sotuba, near Bamako.

In 1964 imports totaled \$49 million, exports \$33 million; 64 per cent of imports and 55 per cent of exports represented trade with the franc zone; 17 per cent of imports and 25 per cent of exports represented trade with the Sino-Soviet bloc. Principal exports are livestock on the hoof, peanuts, peanut oil and fish. The deficit in trade is expected to continue because of purchases for the development program but may be reduced as local products replace imports—sugar and textiles, for instance—and as semi-processed products replace raw products in exports—meat for livestock on the hoof, peanut oil instead of peanuts.

NATIONAL BUDGET

Budgetary data, including the health budget and its relation to the central government operating budget (in amounts and in percentages) and estimated health expenditures per capita are set forth below.

(in thousands)

Year	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs per capita*
1961	\$45,080	\$4,502	10	\$1.07
1962	59,115	5,490	9	1.28
1963	40,100	3,742	9	0.85
1964	42,566	4,506	11	1.00
1965	42,609	4,506	11	0.98

* Based on population estimates of 4.2 million (1961), 4.3 million (1962), 4.4 million (1963), 4.5 million (1964) and 4.6 million (1965).

The average national health budget over the five years was \$4.50 million or 10 per cent of the average operating budget; average annual expenditure per capita was \$1.03.

For 1964-1965 the combined total of the six regional budgets was estimated to be \$12.35 million, of which \$2.35 million or 19 per cent was for health.

Expenditures for personnel in both national and regional health budgets for 1964 average 52-53 per cent, slightly less than the over-all average of 54 per cent in central government operating budget for that year.

ASSISTANCE PROGRAMS

Bilateral. French investment in health activities through FAC from 1959 to February 25, 1964 totalled \$393,000 or 10 per cent of FAC investment during that period. Health aid was devoted mainly to rural medical equipment (\$264,000) and to the campaign against endemic diseases (\$122,000). There were 300 French experts serving under technical assistance programs in Mali in 1964 and 1965, 20-25 of whom were employed in the health program.

American assistance through U.S. AID development loans and grants, technical cooperation assistance and supporting funds totalled \$3.9 million, of which \$100,000 was for health and sanitation projects, in FY 63; \$3.0 million FY 64; and \$1,155,000 FY 65. Two large development loans included in this assistance were \$2.1 million for the teachers college and \$1.1 million for the central veterinary laboratory. U.S. surplus agricultural commodities of the value of \$480,000 were supplied in 1964.

Health assistance in 1964-1965 included \$405,000 for 5 mobile units, other equipment and 250,000 doses of vaccine for the anti-measles campaign; 50,000 doses of smallpox vaccine were also furnished. U.S. AID also furnished (1963) a supply of drugs—streptomycin, isomazide, extencillin and chloroquine.

Health and sanitation projects funded under other categories of U.S. AID assistance (e.g., agriculture) include training and education programs, initiated FY 61 and scheduled for completion in FY 67, estimated to cost \$604,000 and a program of village development, initiated in FY 62 and scheduled for completion

FY 66, estimated to cost \$394,000. (See Appendix 1, Volume I.)

The USSR is reported to have invested \$55 million in assistance up to 1964. Its projects include aid to three higher training schools—the trade school for agricultural and mechanical training (600 student capacity), the school for nurses and midwives (200 student capacity), and the school of public administration (250 student capacity). It has financed and partly staffed projects for mineral prospecting, medical services (20 doctors), dredging of 200 km. of the Niger River, a stadium of 25,000 capacity, and a cement plant of 50,000 tons capacity. It has also provided some aid to the Office du Niger, but the aid is not described and this may refer to the river dredging referred to above.

The People's Republic of China has agreed to extend credits of \$46.6 million (1964), but so far only a fraction of the total has been used. According to announcements by the Mali government, the Communist Chinese will underwrite at least 15 projects and furnish more than 100 technicians. Major projects already completed or under construction are a textile complex (\$8.1 million) and a sugar refinery at Segou, rice and cotton mills, cigarette factory, match factory, and sugar cane culture. Radio Peking has given radio and TV equipment to Radio Mali. Two Chinese bilharziasis experts made an extended visit to the country in 1963.

Mali also has technical assistance agreements with the UAR and Morocco and with most of the smaller countries of the Sino-Soviet bloc. Aid under these agreements involves education and training of Malians either at home or abroad, lending of expert technicians and occasionally financing of infrastructure (North Korea agreed in September 1965 to build a ceramics plant).

West Germany's assistance includes \$1.25 million for water development, a 200-passenger river boat (\$527,000); \$4 million for peanut oil mill at Koulikoro (completed in 1964); and \$3 million under a training agreement by which West Germans will train Malians to operate the peanut mill and will also accept 4 Malians per year for 3 years for training in Germany.

In 1961, Israel provided a team of medical experts who surveyed the health services and disease problems and made recommendations.

In June 1964, Italy signed an economic and technical cooperation agreement but no details of the aid extended are available.

Multilateral. From 1958 to June 30, 1964, FED credits totaled \$33 million. Of this amount \$794,000 was devoted to health projects and \$1.27 million to sanitation projects. (See Table 3, Volume I.) Health projects related to a hospital, a maternity clinic, a surgical suite, a dispensary, 7 X-ray trucks, 3 housing units and the Institute for Human Biology, Bamako. Sanitation projects related to the water supply of Sikasso (\$336,000) and the program of well construction and watering holes (\$932,000). In August 1965 a new contribution by FED to construction of the Institute was announced: \$766,000.

The United Nations Special Fund in 1964 loaned \$910,900 (Mali matching contribution: \$100,000) for improvement of rice culture and \$920,000 (Mali contribution: \$2.469 million) for a secondary school. In 1965, the Fund agreed to supply 5 experts from the ILO for four years to train instructors and monitors for the agricultural development program.

The United Nations Expanded Program of Technical Assistance to Mali in 1964 totaled \$470,997, of which WHO's share was \$121,075 (\$101,006 for 9 fellowships for medical, nursing and auxiliary personnel and \$20,069 for a public health administration expert). Other projects: \$150,789 for development of natural resources and power, statistics, public works and economic programming; \$34,992 for vocational training, small industry and labor organization and administration (ILO); \$40,204 for land and water development, fisheries, and animal production and health; \$89,815 for UNESCO teacher training, adult education, education planning and mass communication.

The WHO program in 1965 related to national health planning, smallpox eradication, environmental sanitation, nursing education and fellowships at an estimated cost of \$121,071 (WHO budget) in addition to \$62,000 from extra budgetary funds (see Table 23).

UNICEF provided assistance for basic health projects (see Table 24). For the period 1965-1967, UNICEF has agreed to contribute \$623,700 for three health programs—campaign against endemic diseases, maternal and child health, and development of social services (pilot project in sanitation near Bamako and continuation of training of health and social personnel. For the same period UNICEF will provide \$312,000 for education programs.

On February 26, 1965, Mali signed an agreement with the World Food Program for 6500 tons of food products to be used in schools and in the livestock program.

ORGANIZATION OF HEALTH SERVICES

The Ministry of Health and Social Affairs includes the directorate of national public health and the directorate of social affairs. The Minister is assisted by a number of technical advisers, one of them being in charge of the development plan and relations with regional and international organizations.

The national public health service (Direction du Service national de la Santé publique) under the Director General of Public Health, is composed of six divisions.

1. Curative medicine: Operates hospitals and other static centers; directs training of medical and paramedical personnel.
2. Preventive medicine, divided into four sections: a) Urban and rural public health and sanitation—handles planning and details of new construction, campaigns against vectors, sanitary inspections and regulations. b) Epidemiology and prophylaxis—campaigns against endemic and epidemic diseases and evaluates methods of control; centralizes epidemiological intelligence, enforces regulations relating to endemic and epidemic diseases. c) Health education—directs and coordinates educational programs for promotion of health and prevention and treatment of disease. d) Health statistics—collects and analyzes statistical data, initiates surveys of prevalence of communicable diseases and special inquiries.
3. Maternal and child health and school health: Coordinates activities of all public and private agencies; plans programs for adult education and school health; trains personnel.
4. Social diseases: Handles planning and programs in tuberculosis, alcoholism, venereal diseases, prostitution, and mental diseases.

5. Pharmacy and technical equipment: Imports, sells and stock medicines and medical and special equipment for health services; and insures the control of pharmacies.

6. Laboratories and special institutes: Coordinates activities of laboratories and special institutes for research.

The Director General of Public Health is assisted by two inspectors of public health. The country is divided into six health regions, corresponding to the six administrative regions. The health region, under a regional inspector of public health who acts as a technical adviser to the governor, groups (or will group in the future) all the preventive and curative services, including the mobile medical teams of the region. In 1964, the responsibilities for regional services of the Director General and the two inspectors of public health were defined as follows: Zone A, including the centers of Bamako and Kati, is directly under the Director General; Zone B (Regions of Kayes, Bamako [except the city] and Sikasso) and Zone C (Regions of Mopti, Ségou, and Gao) are each under an inspector of public health.

The National Social Insurance Institute is responsible for the management of existing insurance schemes; under the Social Insurance Code (1962) enterprises or groups of enterprises are to provide medical and health services for workers. Such medical centers under a group of enterprises have been set up in each of the six administrative regions.

Mali is a member of the OCCGE but has not had officers of the French Marine Corps since 1961. As is known (see page 26), OCCGE's Marchoux Institute for Leprosy Research (Director: Dr. Languillon), the Institute of Tropical Ophthalmology (Director: Dr. Roufic) and its inter-country mobile ophthalmological units are located at Bamako.

Government health facilities include 2 central hospitals (Bamako), 8 secondary or regional hospitals (Markala, Kayes, Gao, Ségou, Mopti, Sikasso and 2 at Kati and Nioro scheduled to begin operations in 1964); 36 medical centers, 12 medical posts, 43 maternities, 230 dispensaries, 42 maternal and child health centers, 7 leprosaria, 1 psychiatric clinic, 1 nursing school (1st degree) and 1 secondary school of health; 40 pharmacies; 4 dental centers.

There are a total of 3400 beds or a bed/population ratio of 1:1350 for an estimated population of 4.6 million in 1965.

In 1963, there were a total of 103 doctors (43 foreign under contracts or technical assistance agreements; and 60 Malian doctors, of whom 14 were docteurs en médecine and 46 medecins africains). There were also 7 pharmacists, 6 dentists, 60 midwives, 943 nurses (of whom 102 had diplômes d'état). In 1963-1964, there were 30 students studying medicine. (In 1964, the USSR signed an agreement to furnish 20 doctors, but since 17 were already stated to be serving in Mali, this may represent a net gain of only 3 doctors.)

On the basis of a total of 103 doctors and an estimated population of 4.6 million, the doctor population ratio is 1:45,000; however, if only native Malian doctors (60) are included, the ratio is 1:77,000.

PUBLIC HEALTH PROBLEMS

The main causes of deaths, according to some data collected by the Ministry of Health and Social Affairs, are ascribed to malaria, gastroenteritis and measles.

Malaria is also the most frequently diagnosed disease in all parts of the country and is the main cause of mortality among children of one to four years of age.

Some dangerous former epidemic foci of trypanosomiasis are found in Mali; in the Bamako area (including the township itself), and in the Sikasso district to the south and the Bafoulabé district in the west. The former is contiguous with the Korhogo focus in Ivory Coast and the western focus in Upper Volta and the latter with the focus of Labe in Guinea. In Bamako district, despite a low attendance rate at sleeping sickness inspections, 675 cases were diagnosed in 1960 and 680 in 1961. A team from the Centre Muraz (OCCGE headquarters) then carried out a project designed to rid the town area of tsetse, by dieldrin spraying maintained subsequently by respraying twice yearly a fringing zone, to prevent the return of the flies to the center. In a thorough entomological check in 1965 a few tsetse were captured in the protected zone, but only three new cases of sleeping sickness were diagnosed inside the zone in 1964. There were in Mali 275 new cases among 387,000 examined during the first seven months of 1965.

There are serious foci of onchocerciasis in the Sikasso and Bougouni districts, and at Nioro, almost on the edge of the Sahara.

Outside of trypanosomiasis and onchocerciasis, leprosy and tuberculosis are most important as they affect economically productive populations, creating important social problems in Mali. Up to the end of 1964, 95,827 lepers had been diagnosed, of whom 13,837 are said to be cured or under surveillance without further treatment. Among the known cases, of which 10 per cent are of lepromatous form, only one third are treated regularly, owing to lack of permanent treatment facilities. Tuberculosis is widespread—according to a recent survey, the number of cases is estimated at 60,000-80,000.

The predominant problems of the northern part of the country are those common to nomads: endemic syphilis, trachoma, leprosy and tuberculosis. There are foci of endemic syphilis around Nioro, in the Diré-Goundam-Timbuktu area, and south of the Niger. Withdrawal of the French doctors and funds soon brought the campaign against endemic syphilis to a standstill. In 1961, in the Diré focus, no one was in charge of the campaign, and not one of its vehicles was roadworthy. In 1964, 13,088 new cases were notified. Cerebrospinal meningitis epidemics have ravaged the southern part of the country in the past. In 1964, only 309 cases were notified in Mali.

Malnutrition is widespread especially among young children and accounts for a high proportion of admissions to hospitals. Two surveys (1962) have shown that food resources in Mali are adequate and much better than in neighboring countries. Government efforts have already contributed to better distribution of certain food-stuffs during the pre-harvest period, but seasonal malnutrition and even kwashiorkor are still present in certain areas.

HEALTH DEVELOPMENT PLANS

A final report on Mali's health plan (prepared with WHO and U.S. AID assistance) which will be integrated with the over-all economic and social development plan for the country, is expected to be completed in July 1966. A preliminary report indicates the order of priorities will be: (1) improved training for personnel; (2) increased emphasis on preventive medicine campaigns against transmissible diseases, with better integration of fixed and mobile services and greater utilization of existing infrastructure rather than new investment; Mali's present budgets are scarcely sufficient to cover operation of present facilities; (3) step-by-step decentralization of health services to regional and local levels.

Health campaigns and budgets are to be planned three years in advance to permit efficient coordination with other sectors of the national economy and with prospective sources of foreign assistance.

The first stage of the plan (January 1965-June 1966) will be devoted to determining future needs in personnel and budget; preparing a long-range training program, a sanitary code, improved methods of collecting and collating statistics, a national program of immunizations, to include at least smallpox, measles and tuberculosis; and completion of such construction and re-equipment as was begun under the first Five-Year Plan.

The second stage (July 1966-June 1971) will include launching improved training programs, beginning the program of national immunizations and beginning regional decentralization. For the training programs it is estimated the following teaching personnel must be added to the staff at the Ecole nationale de Sante: 2 in midwifery; 2 in curative nursing; 2 hygiene and sanitation; 2 social assistance; 1 for the secretariat.

Regional decentralization is estimated to require 24 additional medical specialists—7 in public health, 7 in epidemiology and mass medicine; 7 pediatricians; 1 hospital administrator; 2 tuberculosis specialists; and 28 other professionally trained personnel, i.e., health educators, sanitation technicians, public health nurses.

The third stage (July 1971-June 1976): If decentralization at regional echelons is achieved in the second stage, the third stage should see all districts (cercles) within each region integrated under a chief doctor of the cercle, with hospitalization—general medicine, pediatrics and obstetrics—in 42 chief towns.

If surgery cannot be included in every district service, care will be taken to locate surgical services as conveniently as possible within the regions.

At this stage, also, there will be a permanent program of immunizations and mass campaigns against endemic diseases, and systematic health education of the populace to insure wide participation in health and sanitation programs; sanitary inspection of foods will begin in the chief towns and gradually extend to villages; and the program for potable water and latrines in villages and water and sewage systems for large centers should be well advanced.

It is expected that the doctor/population ratio will rise from 1:77,000 in 1964 to 1:40,000 by 1975, primarily through the selection each year of 20 candidates for the study of medicine.

In view of the shortage of physicians, Mali has decided to open a school for medical assistants (Ecole d'Assistants-Médecins); the medical assistants will be free to return when possible to a faculty of medicine to obtain a doctor's degree.*

* * * *

The development plan aims at the regionalization of health services and a complete integration of preventive and curative medicine at the district or even village level. Owing to the lack of adequate personnel and funds for new centers and dispensaries in rural areas, the implementation of the plan is bound to be slow. The regional directors of health have not been trained so far for their new tasks although a first step was made in the regionalization of budgets. Meanwhile the control of endemic diseases, including tuberculosis survey work, continues to rely on the mobile medical teams.

The determination of the government of Mali to bring preventive and curative medicine and health education to the rural population point to the need for continued support to schools for medical assistants and specialized training programs for auxiliary personnel destined to serve in rural areas.

In view of the slow rate of progress of the predominantly agricultural economy of the country, existing assistance programs, especially those linked with development of rural areas and increase of productivity, should be maintained. It is undesirable to promote projects that place a continuing burden on the economy (such as larger new hospitals).

* Association de la recherche médicale en Afrique occidentale et de Médecine d'Afrique noire: Colloques de Santé publique, 4-10 janvier 1965. Quatrièmes Journées Médicales de Dakar, Dakar, 1965.

Table 23

Estimated WHO Commitments in Mali, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Smallpox eradication	1	1	-	\$ 15,045	\$ 16,584	\$ -
National health planning	-	-	-	47,550	-	-
Nursing education	1	1	1	12,011	13,098	12,858
Training of midwives	-	-	2	-	-	27,748
Nutrition advisory services	-	1	1	-	17,689	16,538
Environmental sanitation	1	1	1	21,465	24,838	22,856
Fellowships	-	-	-	<u>25,000</u>	<u>25,000</u>	<u>10,000</u>
Total	<u>3</u>	<u>4</u>	<u>5</u>	<u>\$121,071</u>	<u>\$ 97,209</u>	<u>\$ 90,000</u>
Other obligations				\$ 62,000	\$269,000	\$212,000
Total estimated Government Contribution				369,275		

SMALLPOX ERADICATION (- 1966). To assist in developing a national smallpox eradication program.

A team of WHO consultants and the smallpox inter-country adviser for West Africa visited Mali in February 1965 to review the smallpox situation and to assist in drawing up a plan of operations for a pilot control project which might be followed by a full-scale eradication project.

The recruitment of a WHO medical officer to be assigned to this project is underway.

NATIONAL HEALTH PLANNING (1963-1964).* To assist in the creation of a national health planning program.

The WHO planner was unable to discuss the final report with the authorities before he left Mali in September. His task will be completed by the assignment of short-term consultants in the fields of organization of general and maternity

* This project received assistance from U.S. AID.

hospitals, health legislation, vital and health statistics and a program of immunization against smallpox. It is hoped that the Health Planning Commission will meet in June 1965.

NURSING EDUCATION (1964-1970).* To assist the development of the basic school of nursing and the organization of nursing services.

The WHO nurse educator took up her duties in late November. She was able to visit hospitals and health centers to assess the availability of practice areas for student nurses. In collaboration with the national teaching staff, the WHO nurse educator has worked on planning the program at the basic school of nursing and the correlation of theory and practice. The school reopened in January with 78 new students. Lists of required books and teaching materials have been prepared to be supplied by UNICEF.

TRAINING OF MIDWIVES (- 1971). To assist the development of the basic programs for the preparation of nursing and midwifery personnel and the organization of nursing and midwifery services.

NUTRITION ADVISORY SERVICES (- 1968). To assist development of the nutritional activities of the health services for prevention and treatment of nutritional diseases, for training of personnel and for organizing nutritional education through the health and social services.

ENVIRONMENTAL SANITATION (1963-1967). To assist in a training program for assistant health inspectors; in setting up an environmental health unit in the Ministry of Health and in planning and developing a national sanitation program.

Two qualified nurses have been assigned to the sanitation unit, and this constitutes a first step towards the establishment of a central sanitation section within the Ministry of Public Health. The program for the training of sanitation staff has not yet started, and a Government decision is awaited on the training plan for personnel prepared by the WHO engineer.

A draft plan of operations has been prepared to include the participation of UNICEF in the development of the pilot zone in the model village of Djoliba. In this village the materials for driven wells have been tested and housing improvements have been proposed.

The Government intends to submit an official request to the Technical Assistance Board for the services of a consulting engineer for two months, and a financial expert for one month, who will study the situation regarding the water supply in Mali.

OTHER WHO PROJECTS

PUBLIC HEALTH LABORATORIES (1964). To analyze the question of laboratory services in Mali; make recommendations for the establishment of a public health laboratory.

The consultant's report was submitted to the Government in September 1964 and comments are awaited. The project is terminated.

* This project receives UNICEF assistance.

COMMUNITY WATER SUPPLY SPECIAL ACCOUNT

A supplement to the provision of the regular budget was allocated by the CWS Special Account for the years 1965 and 1966 successively \$34,000 and \$30,000.

Table 24

UNICEF-Aided Projects in Mali, 1960-1964

Total allocation: \$588,000

BASIC HEALTH AND SOCIAL SERVICES	Approved 1960-64 \$ 298,500
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UNICEF provided basic equipment, vitamins, dried milk and midwifery kits for 7 municipal centers and for 18 district maternal and child health centers and for 40 sub-centers to be established in rural areas. Teaching and demonstration equipment for the nurses' school at Bamako and for the municipal and district centers for training of auxiliary social workers and traditional birth attendants; stipends for selected MCH personnel. UNICEF provided equipment to upgrade 5 district hospitals, 8 main health centers, 10 rural health centers, a mobile health education unit; transport; supplies for the endemic disease control. WHO provides a public health adviser, a nurse educator and a sanitary engineer.

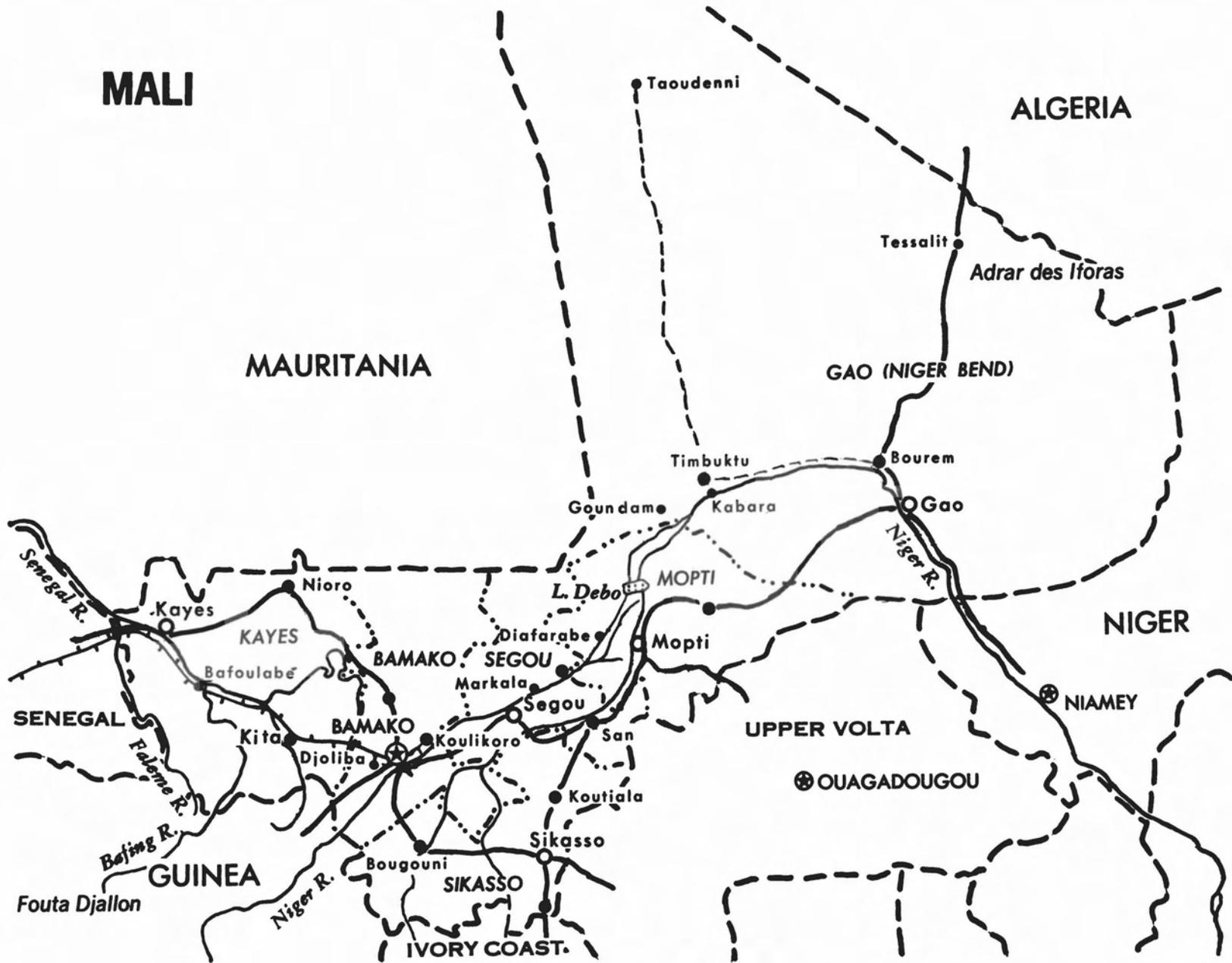
UNICEF also supplied basic equipment for residential re-education centers at Kayes and Mopti; transport; stipends.

LEPROSY CONTROL	Approved 1960 \$ 70,000
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UNICEF provided drugs and vehicles for the 1963 campaign.

EDUCATION	Approved 1964 \$ 220,000
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In 1964-65 UNICEF is providing teaching and demonstration equipment for 5 teacher-training centers and 10 in-service training teams; equipment for 18 schools; stipends for 240 rural and 120 urban teacher trainees. UNESCO is providing 3 teacher-training experts, FAO a consultant in nutrition education and a home economics teacher.



MALI

ALGERIA

MAURITANIA

GAO (NIGER BEND)

Adrar des Iforas

Timbuktu

Tessalit

Bourem

Goundam

Kabara

Gao

Niger R.

L. Debo

MOPTI

NIGER

Diafarabe

Mopti

NIAMEY

KAYES

BAMAKO

SEGOU

Markala

Segou

San

UPPER VOLTA

OUAGADOUGOU

SENEGAL

BAMAKO

Koulikoro

Djoliba

Koutiala

Fouta Djallon

GUINEA

SIKASSO

Bougouni

Sikasso

IVORY COAST

Niger R.

Bafing R.

Falame R.

Kayes

Nioro

Bafoulabe

Kita

Fouta Djallon

CENTRAL AFRICAN REPUBLIC

Population:	1.5 million	Number of doctors:	37
Area:	238,000 sq. mi.	Doctors per population:	1:40,500
Capital:	Bangui	Hospital beds:	1911 or 1:785

GENERAL

Geography and topography. The Central African Republic (CAR), formerly one of the four territories of French Equatorial Africa known as Oubangi-Chari, is located close to the equator in the center of the continent. Chad lies to the north, to the east the Sudan, to the south the two Congo Republics and to the west Cameroun. The country, a rolling plateau between the Congo and Chad basins, consists mostly of savannah grassland with scattered trees, and a dense rain forest in the southwestern corner. Landlocked more than 300 miles from the sea, the CAR has an area of 238,000 square miles with an average density of five persons per square mile.

Population. The CAR's estimated population in 1963 was 1.3 million, but believed to be 1.5 million by the end of 1964. The population is widely scattered in some 6000 villages, of which half have less than 100 inhabitants. The main urban centers are: Bangui, the capital of the CAR, (about 100,000 population), Bouar (26,000), Bambari (20,000), Bossangoa (13,000), Berberati (13,000) and Bangassou (8000).

The total population was believed to have reached, at the end of 1964, 1.5 million. However, population projections based on the only demographic survey of the country (1959) give an estimate of the population for 1965 of 1,270,000, and an annual increase rate of 1.4 per cent. The general mortality, estimated by various methods, would be about 29 per 1000 population. The projected global population in 1985 is expected to be 1,710,000, the school-age population (6-14 years of age) 340,000, and the active male population (15-59 years of age) 465,000.

Government. The CAR became a republic on December 1, 1958, after it voted to join the French Community and later proclaimed its independence on August 13, 1960. The constitutional form of government consists of a legislative assembly of 50 members elected by the people for five years, a president elected by universal suffrage for a period of seven years, and an independent judiciary. In 1960, Mr. David Dacko was elected first president of the independent republic, retaining the functions as head of government which office he had held since April 1959. He was re-elected in 1964. However, on January 1, 1966, Colonel Bedel Bokassa, Army Chief of Staff, seized power in a military coup and ousted President Dacko.

The country is divided into 14 administrative regions (prefectures). Sangho, commonly used as a lingua franca among the numerous ethnic groups of the CAR, was adopted as the national language but the official language remains French.

The CAR maintains close political and economic relationships with the other three equatorial states (Congo (Brazzaville), Chad and Gabon) and with Cameroun as a member of the Customs and Economic Union of Central Africa (UDEAC). It is also a member of the Conference of Heads of State in Equatorial Africa, an associate member of the European Economic Community (EEC), a member of the United

Nations and its specialized agencies, and a member of the OAU and the OCAM.

Education. Recognizing the importance of education in the future development program of the CAR, the Government almost doubled the annual education budget from \$2.5 million in 1962 to \$4.6 million in 1965.

In primary and secondary schools, the rate of enrollment increased substantially. In 1958, before independence, there were 47,400 students enrolled and in 1964, there were 104,700. During this period, the enrollment has more than doubled in the elementary schools, jumping from 45,800 to 100,000 and in the secondary schools from 1100 to 4300. However, in the technical schools, there was a decrease from 500 to 400 students. More village schools and the use of buses to transport children account for some of the growth in elementary school enrollment. Secondary education facilities are limited and emphasis has been placed on technical centers and teacher training schools. Until the CAR develops its own higher institutions of learning, students are sent to universities and institutes outside of the CAR. In 1963-1964, about 200 students were educated in institutions in France (six of these were studying in the medical field), and 70 in other countries of Africa. Records for the last three school terms, 1962-1965, indicate that none have attended the medical school at Dakar.

ECONOMIC RESOURCES

The gross national product of the CAR is difficult to determine. One American source estimates the GNP to be between \$60 and \$80 million with a per capita income of approximately \$50 while another estimates the GNP to be \$116 million with a per capita of \$90 in 1963.

The CAR has few natural resources. It is predominantly an agricultural country and cotton, coffee and peanuts are the bases of the nation's economy. Over 90 per cent of the working-age population is engaged in some aspect of agriculture. One of the major goals of the government is the modernization and expansion of agricultural production. Until 1963, cotton, which is widely cultivated, was the chief export with coffee ranking second, but, in the last few years, the export of diamonds has risen until it ranked first in 1963 and 1964, with cotton second and coffee third. Wood, rubber, groundnuts, sesame seed, pepper, tobacco and medicinal plants are also exported. Most consumer and producer goods are imported. The cultivation of peanuts is increasing. Food crops are raised mostly for local consumption, the principal one being manioc.

Meat is imported from Chad since the small herds of cattle, sheep and goats are not enough to supply domestic needs. Stockraising is carried on in a few regions where the tsetse fly is not prevalent. Successful experiments have been made in introducing strains of livestock which are resistant to trypanosomiasis. However, some time will elapse before the new herds will be large enough to amply supply the local inhabitants.

Until recently, the only minerals being mined were diamonds and gold. Production of the latter has substantially decreased due to the exhaustion of known veins and the increase in cost of labor and materials. Deposits of iron ore, zinc, copper and tin were discovered and traces of uranium have been found in southeastern CAR.

Planned exploitation of the forests in the southwest is under way. Approxi-

mately 15 million board feet of lumber is produced annually, more than half of which is exported. West Germany has agreed to aid in the establishment of a Technical Institute on Wood.

Industries include a few small processing plants, principally concerned with beverages, textiles, footwear, and the processing of peanut and palm oil. However, the government is seeking financial assistance through France and the Common Market to construct brick, ceramic and jute factories and to expand a dairy in the northwestern section of the country.

Communist China agreed in January 1965 to a long-term loan to aid in developing chemical industries. In February 1965, an agreement was signed with Krupp (West Germany) regarding construction material for a vegetable oil and soap factory, supply and assembly of river ferries, a shipbuilding yard, a cement factory, a tannery and installations for processing coffee and fruit juices. A glassware factory is also contemplated. In August, work began on a \$10 million textile complex in Bangui, with ownership divided 60-40 between the French Willot firm and the CAR government. In September, an agreement was signed with Israel to build factories to produce transistor radios, hardware, clothing and lumber.

There are at present no railroads in the CAR, but plans were made to build a rail spur from Bangui to connect with the Transcameroun Railway now under construction. The UN Special Fund will finance a preliminary study. If this line could be realized, it would be an important economic advancement in the CAR as it would not only be a more economical route for exports, it would permit exploitation of the vast untouched forest areas.

In 1964, CAR's total exports amounted to \$28.9 million and the imports \$29.9 million. The larger part of the foreign trade is with France, which receives approximately 46.4 per cent (\$13.4 million) of CAR exports and supplies 58.7 per cent (\$17.5 million) of its imports. The United States received 15 per cent (\$4.4 million) of CAR exports, principally coffee and diamonds, and supplied 5 per cent (\$1.5 million) of its imports.

NATIONAL BUDGET

The total budgetary expenditures for 1965 were estimated to be \$38.3 million; of this, \$8.9 million, or 23 per cent, was capital investment cost. The cost of the central government operations in 1965 was estimated at \$29.4 million, of which \$2.8 million, or 10 per cent, was allocated for health services. In 1965, the per capita cost of health service operations (based on a population of 1.5 million) is estimated at \$1.85. The following table gives budget data for the last five years (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per Cent of Operating Budget	Health Costs per Capita*
1961	\$19,125	\$18,845	\$1,460	7	\$1.10
1962	24,675	24,410	1,570	6	1.20
1963	27,390	24,120	2,042	8	1.55
1964	26,730	23,460	2,395	10	1.60
1965	38,265	29,350	2,785	10	1.85

*Based on population estimate of 1.3 million in 1961, 1962 and 1963; and 1.5 million in 1964 and 1965.

ASSISTANCE PROGRAMS

Bilateral. From 1959 through 1964, French investment credits from FAC amounted to over \$20 million, of which 36.1 per cent was allotted for production, 36.1 per cent for infrastructure, 21.2 per cent for social services and 6.6 per cent for studies. As of June 1, 1965, there were 481 French technical cooperation personnel of whom 176 were assigned to education and 73 to health.

French credits in the field of health through the FAC from 1959 to February 25, 1964 amounted to \$1.3 million, or about 6 per cent, of the total FAC investments in the CAR for that period. This financial aid involved rural medical equipment (\$609,000) and campaigns against the endemic diseases (\$730,800).

Under an agreement signed in August 1965, U.S. AID will furnish \$260,000 in materials for a measles vaccination program for children from six months to six years. To assist the CAR in the development of a national health plan, in cooperation with WHO, the U.S. AID obligated \$88,000 for FY 65 (see Appendix I, Volume I). In FY 64, AID committed \$1.1 million under its program of technical cooperation and development grants to the CAR, relating to food and agriculture, power, transportation, public safety and technical support, but none of this amount was allocated for health. In the FY 63 program, \$700,000 was obligated and \$142,000 of this was for health and sanitation.

In January 1965, Communist China signed a long-term loan for \$4 million of which \$810,000 was provided to establish in the CAR chemical industries for pharmaceutical products, fertilizers, insecticides, etc., \$2.3 million for other type industries (textile, cigarettes, matches, perfumery, etc.) and \$950,000 for housing. However, a few days after the military coup of January 1, 1966, the new government broke diplomatic relations with Communist China.

West Germany granted a loan of \$2 million for the development of tourism, forestry, housing, granite quarrying and assistance to smaller industries.

Israel assisted in the training of youth, teaching the technique of cooperatives and providing fellowships for study in Israel. In addition, loans were made for construction of 300 low-cost housing units at Bangui (\$100,000 for the first phase) and to establish an industrial center valued at \$800,000. In 1964, Israel's technical assistance amounted to around \$80,000 and for 1965 about \$100,000 and \$900,000 in loans.

Multilateral. From 1958 to June 30, 1964, FED credits to the CAR totalled \$14.2 million for 24 projects; of this amount \$3.3 million was invested in health and sanitation projects (see Table 3, Volume I). Other commitments concerned transportation, agriculture and livestock, veterinary centers and construction of schools. Of the \$3.3 million, \$2.4 million represents the investment program for health infrastructure involving 14 hospital pavilions, 13 maternity clinics, 40 dispensaries, 1 nursing school, 64 housing units, 5 X-ray-surgical suites and 5 laboratories for the endemic diseases. The total number of beds involved is 504.

The project costs of the United Nations Expanded Program of Technical Assistance to the CAR in 1964 totalled \$205,185. These projects included \$44,762 from the ILO for manpower organization, social security and labor conditions and administration; \$57,776 from the FAO for animal production and health, rural institutions and services and forestry development; \$64,068 from UNESCO for education

and teacher training; and \$38,579 from WHO for medical education fellowships and environmental sanitation. The projects involved 11 experts and technicians and 9 fellowships were awarded to nationals.

WHO commitments from 1965 to 1967 of about \$245,000 and \$119,000 of other obligations (see Table 25) provided assistance in tuberculosis control (\$35,000), advisory services to the Ministry (\$34,000), nursing education (\$53,000), environmental sanitation (\$64,000) and fellowships (\$59,000).

UNICEF provided funds for projects relating to maternal and child health centers, training of auxiliary health personnel, leprosy control, applied nutrition and education (see Table 26).

ORGANIZATION OF HEALTH SERVICES

A Ministry of Public Health and Social Affairs was created in 1958. The Direction de la Santé publique of the Ministry (Dr. Barthoume Moussa, Director) includes two separate services: the Medical Assistance, which administers hospitals and dispensaries and the National Service for the Control of Endemic Diseases (Director, Dr. Joncour).

The Government plans to create a section on Maternal and Child Health and a special sanitation section under the Ministry. A pilot zone in environmental sanitation will be set up at Yimbi near Bangui.

For the purposes of the control of endemic diseases, the country is divided into five sectors with administrative headquarters in Bangui, Berberati, Bossangoa, Bambari and Bangassou. These sectors have an average area of 46,000 square miles. Each sector has two mobile units. The service conducts campaigns to control leprosy, malaria, trypanosomiasis and yaws. Preventive measures are taken against smallpox through immunization programs. Surveys preceding campaigns against tuberculosis, bilharziasis, and intestinal parasites are being carried out.

To strengthen the control of endemic diseases, the United States provided (1962-1964) 6 mobile clinics and 11 vehicles. West Germany also presented a mobile clinic. The United Kingdom made a gift of a Landrover equipped as an ambulance.

In 1964, medical and paramedical personnel included 33 doctors, 2 of whom are at the Pasteur Institute, 2 pharmacists (at Bangui), 1 dental surgeon, 438 male and female nurses, 44 midwives and 150 other health personnel. Nearly all of the physicians and pharmacists are French. There were 73 French personnel under the technical cooperation program in the health services. As of September 1, 1965, France had provided 37 physicians of the 45 requested by CAR. The average ratio of one doctor for every 40,500 persons is still very inadequate. This ratio is as low as 1 for 127,000 and 1 for 182,000 in some of the rural prefectures.

Doctors and pharmacists are trained in medical institutions in France; registered nurses receive their diplomas in France or from the Brazzaville Institute of Advanced Studies; midwives also study in Brazzaville; and nurses-aides are trained at the Ecole de Formation professionnelle, opened in 1959 in Bangui, which graduates 50 nurses-aides per year. In December 1963, 53 health auxiliaries were graduated from the school. A two-year training program of sanitation staff provided the first five health assistants in 1964 and another five in 1965.

The CAR is divided into 12 medical areas with the following facilities: 1 hospital at Bangui, a secondary hospital at Bouar, 20 medical centers, 18 infirmaries, 32 maternity clinics, 18 maternal and child health centers, 67 dispensaries, 200 rural first-aid posts, a supply pharmacy at Bangui, the Bangui Urban Health Service and the Pasteur Institute (Director: Dr. Chippaux). A total of 1911 hospital beds are available in the CAR of which 400 are in the Bangui Hospital. The bed/population ratio would be 1:785. In 1964, there were two Protestant mission hospitals operating in the CAR.

PUBLIC HEALTH PROBLEMS

Medical assistance in rural areas is especially difficult owing to the dispersion of small villages over a wide area and to the presence of a considerable nomad population. The intrinsic problems are accentuated by long uncontrollable frontiers with the Sudan and Congo (Leopoldville). The east-west route across the CAR has been used by pilgrims and traders since long before the advent of Europeans and has a material effect in spreading epidemic diseases. There has been danger more recently of the spread of disease by refugees from Congo (Leopoldville).

One of the oldest and most dangerous epidemic foci of trypanosomiasis exists in the CAR (where the first modern trypanosomiasis campaign was initiated). The disease is under control, but not eradicated. In 1964, there were 101 cases, including 18 new cases, discovered among 759,000 persons visited during the year. Malaria control is confined to the distribution of prophylactic nivaquine to school-age children. Yaws is no longer a public health problem and progress has been made in controlling endemic syphilis and leprosy. The number of registered cases of leprosy decreased from 63,263 (52,000 under treatment) in 1961 to 57,833 (44,319 under treatment) in 1964. The number of fixed treatment centers was increased from 110 to 128 in 1963.

Cerebrospinal meningitis has occurred in major epidemics. It is not active at present, but could become epidemic again at any time. There is a serious focus of onchocerciasis in the Oubangui-Bomu region, adjacent to the Uele focus in the Congo (Leopoldville). This was the first focus of onchocerciasis in Africa to be noticed (in 1904) and fully described (in 1913), although strangely enough blindness was not attributed to it at that time. Tuberculosis is admitted to be a very serious problem, but case-finding has not been organized so far and most cases are seen far too late. The average daily food intake of the African peasant hardly reaches 2000 calories and alcoholism further adds to problems of malnutrition.*

Bilharziasis (especially the intestinal form) is present in all parts of the country; the highest incidence (13 to 34 per cent of those examined) is in the northwest in the Ouham-Pende and Ouham prefectures. A foci of urinary bilharziasis is present in the northwest of the CAR; infection has also been found in the Ubangui Valley south and northeast of Bangui. Filarial diseases and trachoma are present.

* This statement is based on the opinion of French observers. However, a clinical nutrition study conducted by a WHO consultant in 1963 showed no (clinical) evidence of malnutrition.

The last clinical case of yellow fever was reported in 1949 in the Bangui area but there is evidence of the persistence of the virus in many areas. Immunity level is high among adults but quite inadequate among children.

Table 25

Estimated WHO Commitments in Central Africa Republic, 1965-1967

Project	Number of Posts			Estimated Obligations		
	1965	1966	1967	1965	1966	1967
Tuberculosis control	-	-	2	\$ -	\$ -	\$ 34,963
Public Health Administration:						
Advisory services	-	-	-	-	17,583	16,420
Nursing education	1	2	3	8,707	14,306	30,073
Environmental sanitation	1	1	1	16,766	17,813	28,924
Fellowships	-	-	-	<u>16,000</u>	<u>19,200</u>	<u>24,000</u>
Total	<u>2</u>	<u>3</u>	<u>6</u>	<u>\$ 41,473</u>	<u>\$ 68,902</u>	<u>\$134,380</u>
Other obligations				\$ 24,000	\$ 48,000	\$ 47,000
Total estimated Government Contribution				1,000	1,000	

TUBERCULOSIS CONTROL (1967-1970). To assist in building up a national tuberculosis program integrated with the general health services.

PUBLIC HEALTH ADMINISTRATION: Advisory Services (1966-1970). To assist the Ministry of Health in the operation of national health services and advise on their planning and implementation, also to advise on training programs for professional and auxiliary personnel.

NURSING EDUCATION (- 1970). To assist with the development of the program for basic nursing education at the school of nursing.

ENVIRONMENTAL SANITATION (1964-1968).* To assist in training sanitation personnel; planning and developing a long-term sanitation program and establishing a unit of sanitation within the Ministry of Health.

Activities have been principally in the field of local training of sanitation staff and establishing a pilot zone. The training course for health assistants covers two years of which the first is taken in common with the student nurses. The first group of five health assistants qualified in November 1964 and five new students were admitted to the second year at the beginning of 1965.

* This project receives UNICEF assistance.

The establishment of a pilot zone at Yimbi, situated near to Bangui, has been agreed upon in principle by the competent services. The WHO engineer made a survey of the surrounding hills to find possible sources of water. The delivery of UNICEF supplies and equipment for the first phase of the project has been spread over a long period. The project has proceeded according to plan, except for the delay in the establishment of the pilot zone.

OTHER WHO PROJECTS

LEPROSY CONTROL (- 1967).* To assist leprosy control activities.

During 1964 a short-term consultant visited the country for the assessment of the leprosy situation. UNICEF continued to provide drugs and equipment.

After many years of leprosy control there are still 57,833 registered leprosy patients. Absenteeism is very common. It is estimated also that an examination of each individual patient is needed in order to decide whether he should stay under treatment or be put under observation without treatment. The consultant recommends that the training of personnel and the case-finding method should be improved and that special care should be taken for lepromatous patients.

* This project receives UNICEF assistance.

Table 26

UNICEF-Aided Projects in Central African Republic, 1960-1964

Total allocation: \$267,000

BASIC HEALTH - MATERNAL AND CHILD HEALTH (MCH) Approved 1962
\$ 42,000

Creation of a nucleus of national health personnel through assistance to the training school and strengthening of the facilities of the 12 rural and 6 urban health centers. UNICEF is providing equipment for MCH centers; nursing and midwifery kits; milk and vitamins; teaching, laboratory and printing equipment and transport. WHO is providing the services of a representative, a nursing adviser, as well as fellowships.

ENVIRONMENTAL SANITATION Approved 1964
\$ 21,000

A pilot project in a district with some 2000 inhabitants to determine suitable methods for improving sanitation. UNICEF is providing equipment and supplies for the teaching and for laboratory work; equipment for a workshop and for well construction; vehicles and stipends for 30 trainees. A WHO sanitary engineer is preparing the organization of the courses.

LEPROSY CONTROL Approved 1960-64
\$ 66,300
Additional commitment 25,000

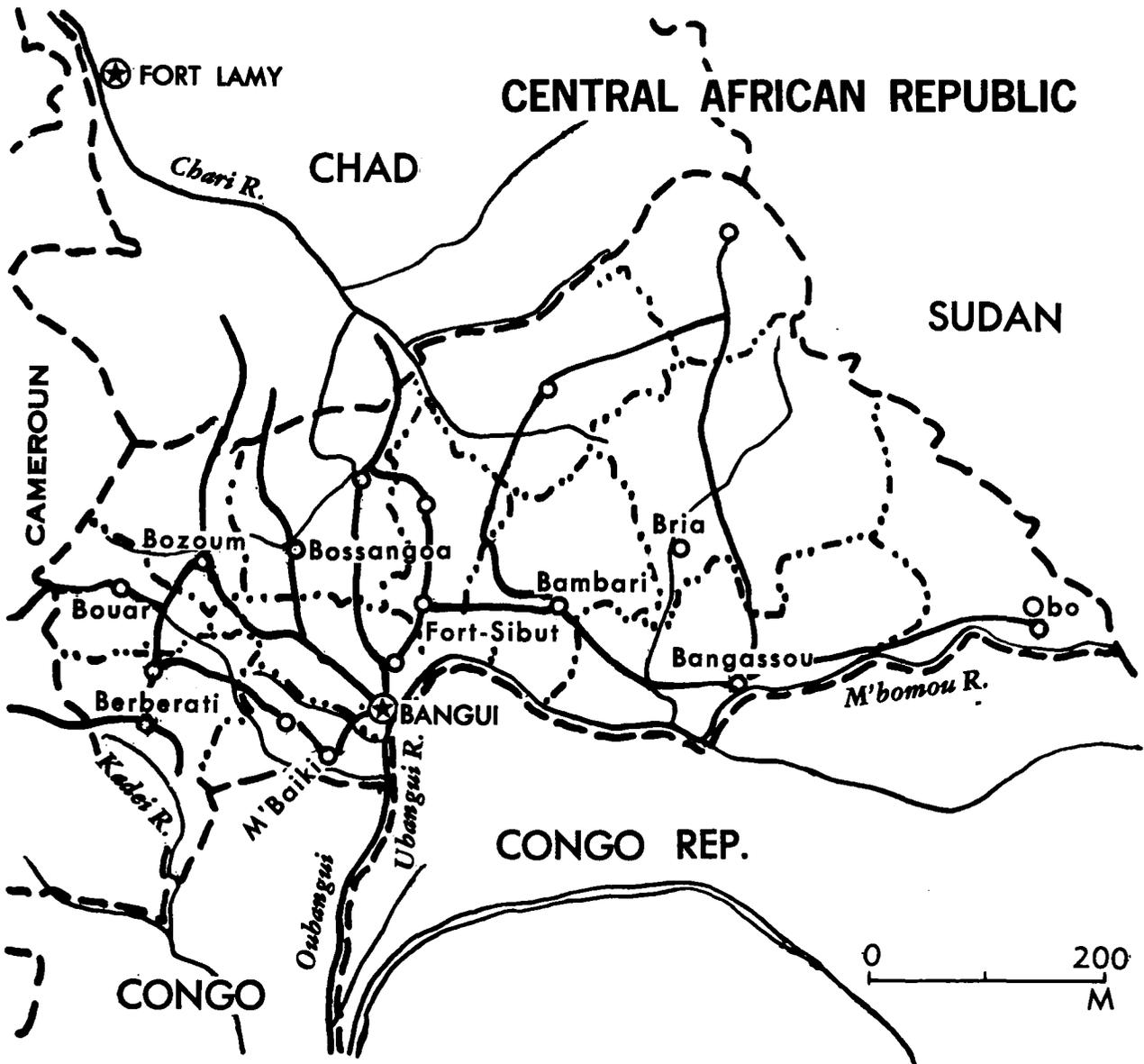
UNICEF is providing drugs, injection equipment and transport for the campaign.

APPLIED NUTRITION Approved 1962
\$ 53,000

In connection with a nutrition survey and a pilot zone with demonstration activities in agriculture and nutrition, UNICEF is providing equipment for school canteens and gardens, supplementary foods, stipends and funds to finance the post of a home economist in 1965. FAO provides guidance to the project. WHO furnished fellowships (1962 and 1963). A joint FAO/WHO team will evaluate the project (1964-65).

EDUCATION Approved 1963
\$ 77,000

UNICEF is providing reproduction, audio-visual and primary education materials, laboratory equipment, library material, vehicles and salaries for three experts in nutrition, home economics and health subjects for the teacher-training school. (The new teacher-training school is expected to accept students in fall 1965.)



REPUBLIC OF CHAD

Population:	3.3 million	Number of doctors:	41
Area:	496,000 sq. mi.	Doctors per population:	1:80,500
Capital:	Fort Lamy	Hospital beds:	3380 or 1:975

GENERAL

Geography and topography. Chad, the largest of the four former territories of French Equatorial Africa, has a land area of 496,000 square miles. It borders on Libya in the north, the Sudan in the east, the Central African Republic in the south, and in the west, it touches Niger, Nigeria and Cameroun. Landlocked, like the CAR, its boundary is more than 800 miles from the nearest seaport in Douala, Cameroun. From Lake Chad in the west, the land slopes gently upward towards the Wadai Mountains in the east and, in the north, reaches an even greater altitude in the Tibesti Mountains of the Sahara Desert. Between these two mountain chains stretches a plateau. Southward from the Lake area, the terrain again curves gradually upward to the equatorial rain-forests near the CAR border.

Chad has three geographic zones: (1) wooded savannah with a rainy season of six to seven months and an annual rainfall of 35 to 47 inches in the south; (2) an intermediate zone with four to five months of rain and 20 to 30 inches of rainfall in the Fort Lamy area; and (3) the desert region with less than 8 inches of rainfall a year in the northern half of the country.

Population. Preliminary figures, obtained from the first national census taken in January 1964, indicated a total population of about 3.3 million. Assuming the annual rate of increase to be 2 per cent, the total population would reach in 1985 about 4.8 million, the school-age population (6-14 years of age) 1.1 million, and the active male population (15-59 years of age) about 1.25 million. The population density averages 7 inhabitants per square mile. However, most of the population is concentrated around the Lake region and on the savannah land extending southward where the agricultural crops are grown. Here, the population density is much higher and in the north, where approximately 50,000 nomads roam over vast areas, the density rate is as low as 1 person to every 3 or 4 square miles.

The principal urban centers are: Fort Lamy, the capital (100,000 inhabitants), Moundou (25,000), Fort Archambault (20,000) and Abéché (13,000). The urban population represents about 3.5 per cent of the total population. There are eight municipalities each administered by a mayor and an elected council: Fort Lamy, Abéché, Bongor, Doba, Fort Archambault, Koumra, Moundou and Pala.

Government. Chad favored the French Community and became a Republic on October 26, 1958; it proclaimed independence on August 11, 1960 and François Tombalbaye became the first President of the new Republic. Chad has a constitutional form of government with executive, legislative and judicial branches. The constitution also established an Economic and Social Council. There are now 14 administrative units or prefectures in Chad. One of these prefectures, Borkou-Ennedi-Tibesti (B.E.T.), an area in the north of 223,938 square miles with 50,000 nomads, has been controlled by the French Army since 1925, but came under Chad administration in January 1965.

Chad maintains close political and economic relationships with the other three equatorial states and with Cameroun as a member of the Customs and Economic Union of Central Africa (UDEAC). It is also a member of the Conference of Heads of State in Equatorial Africa, an associate member of the European Economic Community (EEC), a member of the United Nations and its specialized agencies, and a member of the OAU and the OCAM.

Education. In 1965, 14.5 per cent, or \$4.8 million, of the operating budget was allocated for national education. There are an estimated 722,000 children of school age (6-14 years) of whom 17 per cent are attending the primary, secondary and technical schools. School distribution is unevenly divided throughout the country. In the extreme south of Chad, where the area is more densely populated, the educational system is more developed. Each regional capital has well-equipped elementary schools and many village schools have been constructed. In 1963, there were 389 public and missionary schools in Chad. The total number of teachers was about 1100, of whom 248 were French.

In the elementary schools, enrollment has more than tripled since independence. At that time, there were 32,610 pupils in the primary grades and in 1964, there were 115,000. During the same period, the secondary and technical schools have increased their enrollment from 700 to 4400 students.

In 1963, a National School of Administration was opened at Fort Lamy and a National School of Telecommunications at Fort Archambault. Plans are in the making to establish a National School of Social Service.

Teacher training courses are offered in Bongor and at Fort Archambault. Students who plan to pursue higher education attend universities in France mostly, the Center for Higher Education in Brazzaville or the University of Dakar. There are 150 students presently in foreign institutions. During the 1963-1964 term, 65 from Chad were studying in France. There were no students registered in the Faculty of Medicine at Dakar for the last three school terms.

ECONOMIC RESOURCES

The gross national product was recently estimated to be around \$190 million with an average annual per capita income of \$55. The active population was estimated at 1,350,000 workers with 1,200,000 of these engaged in agriculture, stock raising and fishery. The cotton planters earn an average per capita income of \$20, the stock raisers revenue averages \$32 per individual, and the fishermen about \$101.

Chad's economy is based predominantly on agriculture, chiefly cotton, and on livestock production. Crops include millet, sorghum, rice, corn, sweet potatoes and yams, peanuts, dates, manioc and wheat. In the last several years, cultivation of sugar cane and tobacco was started. The production of food is mainly for domestic consumption and accounts for half the GNP. As a result of French financing, cotton has increased substantially in quality and yield and remains the most important crop and primary export of Chad. Livestock is raised both for local consumption and for export. Meat packing is the second largest industry. There are two slaughter-houses and refrigerated packing plants, one in Fort Lamy whence meat is exported by air, and one in Fort Archambault.

All vaccines required by the department of animal husbandry are produced by the Farcha Laboratory (Laboratoire de recherches vétérinaires et zootechniques de Farcha, Fort Lamy), one of the institutes under the IEMVT of Maisons Alfort (France). The Farcha Laboratory also insures meat inspection and provides training for assistant meat inspectors and veterinary technicians. Research of the laboratory and of the regional research zone was to be, according to an agreement, financed jointly by France and the Chad governments.

Industrial activities include the processing of cotton, meat and related products for export, the processing of agricultural products, mostly for local consumption, (three rice mills, a peanut-oil plant, a dairy, a flour mill, a sugar refinery and a brewery), a fish cannery, a perfume plant, a tannery, a shoe factory, and plants to produce bricks and metal goods. In 1965, an agreement was made with a private German-French condominium for the construction of a textile factory at Fort Archambault to be financed by Germany, France, Cameroun and Chad in the amount of \$6 million.

The only exploited mineral resource at present is natron, a low-grade salt, some of which is exported to Nigeria and the Central African Republic. Traces of tin and tungsten have been discovered in Tibesti. Fresh-water fishing is an important activity in Chad and smoked and dried fish are exported to other African countries.

No railroads exist in Chad but preliminary studies, financed by FAC and FED, are being made for an extension of the Transcameroun Railway from Ngaoundéré to Moundou and Fort Archambault, which will connect the latter town with the seaport of Douala (Cameroun). Financing will be requested from the FED and the U.S. It is hoped that construction might begin in 1968. There are about 11,250 miles of roads and 7500 miles of dirt trails in Chad but during a considerable portion of the year, many of them are impassable. The principal routes are Maiduguri-Fort Lamy; Fort Lamy-Abéché; and Abéché-Fort Archambault with an extension to Bangui (Central African Republic).

Three urban centers have centrally-generated electrical systems: Fort Lamy (5100 kw), Abéché (160 kw) and Moundou (900 kw). Electricity elsewhere must be generated by private power units. The FAC is financing electrification at Fort Archambault and Largeau, and plans to utilize the falls at Gauthiot, north of Pala-Léré, are under study.

In 1963, Chad's total exports amounted to \$23.7 million. Of this amount, cotton represented 77 per cent or \$17.5 million and livestock (on the hoof, meats, hides and skins), the second most important export, about 15 per cent or \$3.5 million. Other products exported include natron, peanuts, gum, fish and dates. France received about 55 per cent of the exports or \$12.5 million. United States purchases in Chad were negligible and in 1964, there were none. Total imports to Chad in 1963 were \$29.1 million, 53 per cent of which came from France. Imports from the United States, some of which included pharmaceuticals, represented 7.4 per cent or \$2.1 million.

NATIONAL BUDGET

In 1965, Chad's estimated budget totalled \$37.8 million of which \$33.5 million was for operating expenses. Health services accounted for 10 per cent, or \$3.3 million, of the operating budget. Based on an estimated population figure

of 3.3 million, the average per capita for health services was \$1.00.

The following allotments to cover personnel and services were included in the 1964 national health budget: Fort Lamy Hospital (including \$6600 for the school of nurses): \$208,800; the Polyclinic: \$22,300; medical assistance: \$343,200; pharmacy supply: \$530,000; public hygiene: \$28,800; and endemic diseases: \$40,000. In the 1964 investment and equipment budget, \$68,900 was earmarked for construction of three housing units for medical personnel (FAC) at Bongor, Koumra and Flanga; \$9300 for construction of a medical unit near the government headquarters; \$36,500 for construction of a dispensary at Ounianga; and \$36,500 for window panes and sanitary improvement at the Fort Lamy Hospital.

The following table gives budget data for the last five years (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$22,318	\$21,888	\$2,038	9	\$.80
1962	23,602	23,262	2,269	10	.90
1963	28,833	24,538	2,427	10	.90
1964	28,172	26,039	2,776	11	.85
1965	37,785	33,508	3,327	10	1.00

* Based on estimated population of 2.5 million in 1961 and 1962, on 2.8 million in 1963, and 3.3 million in 1964 and 1965.

In late December 1965, the National Assembly adopted a balanced budget for 1966 of about \$42 million.

ASSISTANCE PROGRAMS

Bilateral. From 1959 through 1964, French investment credits from FAC amounted to nearly \$30 million. As of December 1, 1964, 423 French technical cooperation personnel were serving in Chad of whom 152 were in education and 75 in health. French investment in the field of health through the FAC from 1959 to February 25, 1964 amounted to \$1.9 million or about 11 per cent of the total FAC investments in Chad during that period. This assistance involved the completion of the hospital (\$466,900) and the enlargement of the pharmacy (\$101,500) at Fort Lamy, rural medical equipment (\$60,900) and the campaign against the endemic diseases (\$1,360,100).

Included in the assistance provided by the United States are equipment for laboratories in secondary and technical schools, training of personnel in the United States and in schools of other African states, and aid in the fields of transportation, communication, agriculture, sanitation and veterinary services. In FY 63, U.S. AID committed over \$1 million for development grants of which \$823,000 was allocated for health and sanitation, including \$610,000 for the Fort Archambault water supply system. In FY 64, \$128,000 out of a commitment of \$587,000 was for health and sanitation. In FY 65, \$290,000 was allocated for a project begun in 1963 to aid in the establishment of adequate services for school children (see Appendix 1, Volume I).

China (Taiwan) supplied agricultural technicians for a two-year period beginning March 1965, and agreed to furnish agricultural materials, fertilizers and

insecticides. In June 1965, it agreed to make \$3 million available over a five-year period to be used partly for a program of construction in Fort Lamy and the remainder to be used in the development of agriculture and industry and for the payment of foreign experts to assist in this program. Chinese technicians will be sent to promote development of agriculture and forestry and Chad will send trainees to attend technical schools in Taiwan.

Canada provided seven professors for the scholastic year 1964-1965. Great Britain made a grant for development of the reclaimed land near Lake Chad. Israel is supplying technical assistance in the fields of education, public health, industrial development and exploitation of natural resources. In March 1965, an Israeli medical mission, composed of a surgeon, a physician and a pediatrician, was sent to Chad for three months. Italy plans to provide technical cooperation for petroleum prospection. The Netherlands will supply technical assistance for problems of reclaimed land and for civil engineering aid in the Lake Chad region. Switzerland offered a credit toward building an agricultural station at Fort Archambault. Yugoslavia provided technical assistance in the construction of model farms.

Multilateral. From 1958 to June 30, 1964, FED credits to Chad totalled \$28.2 million for 18 projects. Of this amount, \$11 million was invested in health and sanitation projects (see Table 3, Volume I). Other commitments during this period involved schools and roads. Financial assistance to the health infrastructure, amounting to \$7.1 million of the \$11 million, relate to 3 hospitals, 29 hospital pavilions, 7 maternity clinics, 1 nursing school, the expansion of out-patient clinics at Fort Lamy, 5 social centers, 81 dispensaries and 21 housing units.

The project costs of the United Nations Expanded Program of Technical Assistance to Chad in 1964 totalled \$331,686. These projects involved \$50,775 provided by the ILO for manpower organization and labor conditions and administration; \$106,208 from the FAO for land and water development, plant production and animal production and health; \$66,555 from UNESCO for education and teacher training; and \$58,938 from WHO for environmental health. There were 15 experts and technicians connected with these projects and 10 fellowships awarded nationals.

WHO assistance programs during 1965-1967 (see Table 27) relate to advisory services in public health administration, nursing education, maternal and child health, environmental sanitation and fellowships.

UNICEF provided funds for projects related to maternal and child health, training of auxiliary personnel, leprosy control and applied nutrition (see Table 28).

The World Food Program (see page 62) sponsored in the region of Lake Chad itself a project for land development and wheat growing and a school-feeding program as part of the project to encourage semi-nomadic people to remain in the area.

ORGANIZATION OF HEALTH SERVICES

Health activities come under the Ministry of Public Health and Social Affairs (Minister: Maurice Adoum). The health and social services are being reorganized and health infrastructure is being set up at the central, prefectural and sub-prefectural levels.

As far as is known, the department of public health has two main divisions, one concerned with static medical care establishments and the second with the Endemic Diseases Control Service (Service des grandes endemies, director: Dr. Ziegler). Other divisions deal with pharmacies and training of paramedical personnel. An environmental sanitation division will soon be established in the Ministry.

Medical facilities in 1964 consisted of 4 hospitals (1 general hospital at Fort Lamy - 600 beds, and 3 second-grade hospitals at Moundou - 360 beds, Fort Archambault - 420 beds, and Abéché - 365 beds; the latter two are to be replaced); 3 leproseries; 25 medical centers; 17 infirmaries; 89 dispensaries; 17 maternity clinics; 1 polyclinic; 12 ambulances and 1 X-ray survey truck. The total number of beds is 3380 or 1 bed per 975 inhabitants.

In 1965, the Lions Club of Fort Lamy donated surgical materials to equip the ophthalmological service at the Fort Lamy Hospital.

The Endemic Diseases Control Service has five centers throughout the country with a sixth one soon to be created. It operates by means of mobile units insuring diagnosis and treatment, distributing drugs and giving routine inoculations.

In 1964, personnel working in the administrative and general health services of the Ministry numbered 1033, of whom 75 were French. Medical and paramedical personnel included 36 doctors, 5 surgeons, 1 dental surgeon, 3 pharmacists, 11 midwives and 768 male and female nurses. Chad requested 52 French physicians and as of September 1, 1965, France had provided 41. Based on an estimated 3.3 million population, the average ratio of 1 doctor for every 80,500 persons is the most unfavorable among the 15 countries.

The reorganization of the health services has proceeded slowly because of the acute shortage of qualified personnel.

Nurses, auxiliary nurses, midwives and social workers are trained at the National School for Nurses, opened in 1959 in Fort Lamy. In October 1964, there were 77 first-year students and 50 second-year students. Special courses for sanitarians have been added to the curriculum. UNICEF aided in providing scholarships and teaching equipment. (See Tables 27 and 28.) Physicians are trained in France. However in 1963, there were only two medical students from Chad at the medical faculties in France.

In 1963, a nutrition center (Centre de nutrition et de technologie alimentaire de la République du Tchad, CNTA) was created for the purpose of coordinating control and research in food and nutrition. Plans are under way to create a National Pharmaceutical Office to control the purchase and distribution of pharmaceutical products. Also envisaged is a National Institute of Hygiene and Microbiology.

PUBLIC HEALTH PROBLEMS

The health services are faced with the difficult problems of lack of personnel and of inadequate medical facilities. Mass medical campaigns are almost impossible to conduct among the nomads and the widely scattered population.

Tuberculosis is the main disease problem of Chad and the undernourishment of

the population accounts for the lack of resistance to the disease. Leprosy, endemic syphilis, trachoma and gonorrhoea—commonly associated with the drier sahel regions and shortage of water—are still widespread. Cerebrospinal meningitis is a constant threat. Sporadic outbreaks of smallpox require continued attention. Malaria incidence shows considerable variations in its distribution and is stated to be on the increase. Helminthic infestation is considerable. Tetanus and puerperal infections are common; measles is believed to be a major cause of death among children.

The incidence of tuberculosis is heavy. About 1,151,000 persons were vaccinated with BCG throughout the country from 1960 to 1964. This important program may be interrupted owing to lack of funds. In 1963, the Endemic Diseases Service initiated a case finding and treatment campaign in Fort Lamy. A limited supply of drugs was received from FAC in 1964. Malnutrition is widespread; general nutritional surveys have been carried out with a view to assessing its importance. The Government's five-year plan for nutrition includes ways to improve diet through the modernization of agricultural methods and animal production. Selected schools in a pilot zone will benefit from nutrition education and the distribution of local protein-rich food. Students will also participate in producing part of the food to be used in the program.

Leprosy control programs have been operating in Chad under the Endemic Diseases Control Service. In 1961, out of 57,118 registered cases of leprosy, 39,049 were under treatment and, in 1964, of 55,263 registered cases, 38,231 were under treatment. Preventive measures through seasonal chemoprophylaxis (sulphonamides) are taken against cerebrospinal meningitis. In 1961, there were 6462 cases and 449 deaths. Of this number, 3688, or 57 per cent, of the cases and 218 of the deaths were in the Chari-Baguirmi prefecture. Onchocerciasis exists in Chad, particularly in the southwest area, but is not considered a serious problem. Yaws is being controlled.

Smallpox accounted for 1157 cases in 1962 and only for a few cases during the next two years. A three-year smallpox vaccination campaign to cover all the population of Chad began in January 1965. By November of the first year, 1,022,096 vaccinations had been given. In April 1965, a smallpox epidemic started with 25 pilgrims from Nigeria en route to Mecca. A total of 73 cases and 10 deaths were reported in 1965 in the Ouaddai prefecture bordering Sudan, but no cases have been found in Chad since October 7, 1965. Vaccination campaigns are also conducted against yellow fever.

The only important focus of trypanosomiasis was on the Logone and Chari Rivers, bordering on Cameroun. During 1961, the two countries collaborated in a successful pilot project, costing \$12,000, for eradication of the vector Glossina tachinoides by insecticide spraying.

* * * *

The existing programs of modernization of agricultural methods and animal production, of improvement of diets, as well as efforts to train paramedical personnel, remain the top priority objectives. Health education and simple environmental sanitary techniques, including the development of water resources, also deserve special attention. Meanwhile, the difficulties of assistance to widely scattered human settlements will continue to require the strengthening of the mobile medical units.

Table 27

Estimated WHO Commitments in Chad, 1965-1967

<u>Project</u>	Number of Posts			Estimated Obligations		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Public Health Administration:						
Advisory Services	-	1	1	\$ -	\$ 17,217	\$ 16,042
Nursing education	2	2	2	18,305	23,116	25,956
Maternal and child health	2	2	2	27,693	27,104	30,925
Environmental sanitation	1	1	1	19,239	18,638	20,241
Fellowships	=	=	=	-	8,000	6,000
Total	<u>5</u>	<u>6</u>	<u>6</u>	<u>\$ 65,237</u>	<u>\$ 94,075</u>	<u>\$ 99,165</u>
Other obligations				\$ 63,000	\$ 76,000	\$ 60,000
Total estimated Government Contribution				163,566	24,490	

PUBLIC HEALTH ADMINISTRATION: Advisory Services (1966-1970). Within the Ministry of Health to advise on and assist the development and organization of health services and training programs for professional and auxiliary health personnel.

NURSING EDUCATION (1964-1970).* To continue assistance in the development of the School of Nursing and in planning for the raising of standards to the Diplôme d'Etat level.

During the school recess in August 1964, the WHO nurse educator was able to visit the student nurses who were having practical experience in hospitals and health centers outside Fort Lamy.

The school reopened in October 1964 with 77 first-year students, and 50 second-year students, including five midwives and 10 auxiliary social workers.

The shortage of teaching staff has been acute. Efforts have been made to provide effective instruction for the students and to correlate theory with practice. The possibility of raising the level of the general education of the candidates for future entry to the school is now under study. UNICEF assistance has continued through scholarships and supplies. Legislation regarding the organization of the School of Nursing has been revised.

*This project receives UNICEF assistance.

MATERNAL AND CHILD HEALTH (1965-1968).* To continue assistance in the training of health personnel so as to be able to expand maternal and child health services, to organize and staff maternal and child health centers, primarily in rural areas.

A first addendum to the basic plan of operations was signed by the Government in September 1964.

A medical officer was selected for the post of WHO Maternal and Child Health Officer and reported for duty February 23, 1965. A public health nurse educator was selected and was expected to be assigned to the project in September 1965.

ENVIRONMENTAL SANITATION (1964-1968).* To assist in the training of sanitation personnel; in carrying out a nation-wide sanitation program and in establishing a sanitation unit within the Ministry of Health.

Six students were admitted to the course for public health assistants but it was subsequently decided that first they should receive two years training at the Ecole nationale d'Adjoints techniques under the Ministry of Public Works before their year of specialization in environmental health. Three high school graduates, WHO fellows, were admitted to the Ecole de Génie Rural, Strasbourg, for training in the field of environmental health.

The construction of sanitary facilities in the pilot zone of Mandélie has been finished and campaigns for the construction of wells and family latrines are being studied. The WHO engineer participated in several committees, one of which is for town-planning in Fort Lamy. He also carried out a survey on the water supply situation in three sub-prefectures. The project has continued satisfactorily, in spite of the delay in the establishment of the pilot zone.

*This project receives UNICEF assistance.

Table 28

UNICEF-Aided Projects in Chad, 1960-1964

Total allocation: \$314,000

MATERNAL AND CHILD HEALTH (MCH) AND ENVIRONMENTAL SANITATION Approved 1961
\$ 147,600

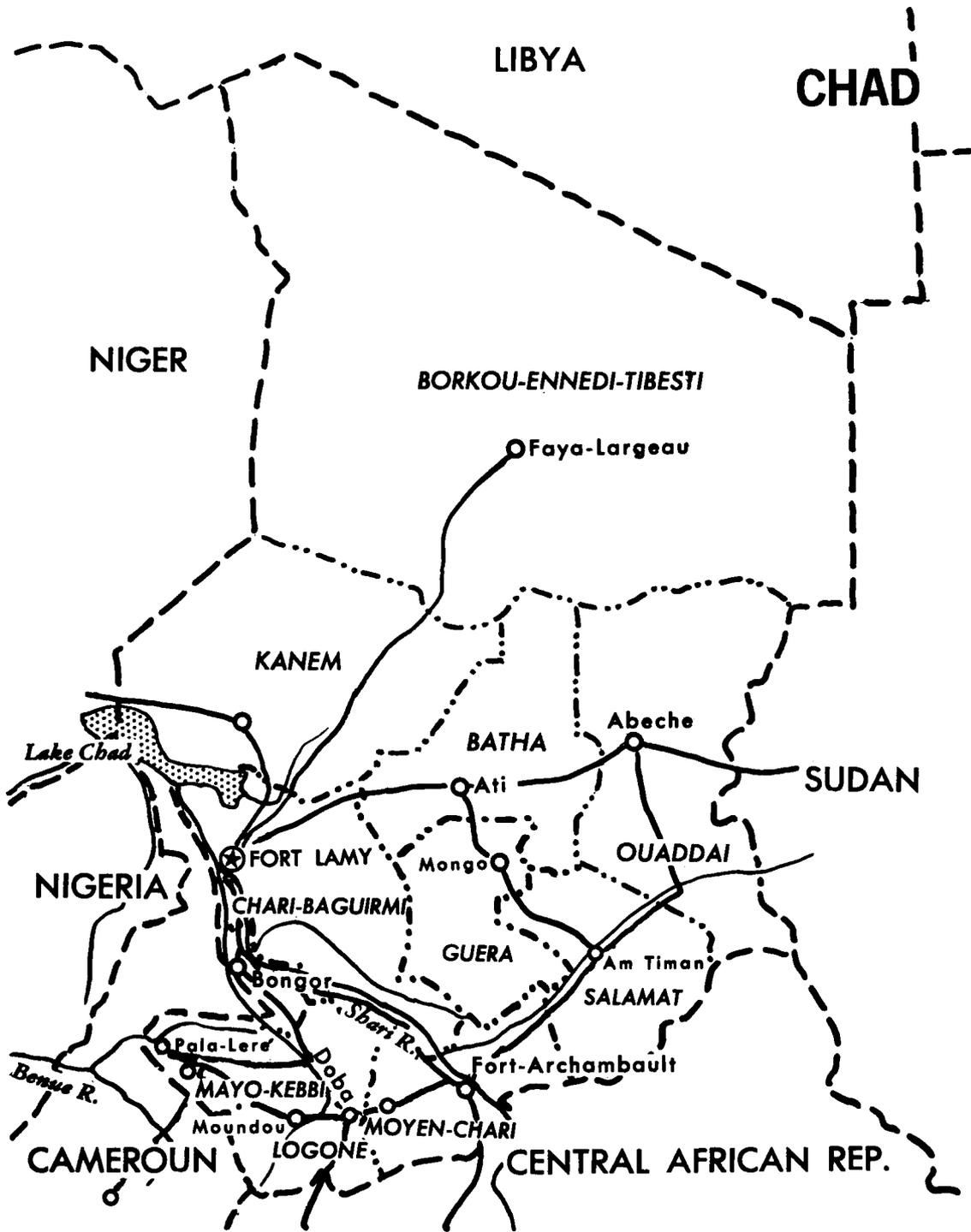
UNICEF is providing teaching equipment for the Fort Lamy school for auxiliary nurses, midwives and social workers, for the community development training center, 10 sub-centers and 5 rural maternities; vehicles; stipends and salaries for two instructors. WHO will furnish the services of a MCH specialist, or nurse educator and a sanitary engineer.

LEPROSY CONTROL Approved 1960-64
\$ 85,400
Additional commitment 24,000

UNICEF is providing drugs, equipment and transport and WHO a consultant to evaluate the campaign.

APPLIED NUTRITION Approved 1963
\$ 81,200

UNICEF is providing equipment for the National Center of Nutrition and Food Technology; survey material, equipment for 15 school gardens, canteens and poultry runs; vehicles, supplementary foods; stipends for 50 trainees; 2 fellowships for training nutritionists, salary of an expert in home economics.



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REPUBLIC OF THE CONGO
(BRAZZAVILLE)

Population:	850,000	Number of doctors:	57
Area:	133,500 sq. mi.	Doctors per population:	1:15,000
Capital:	Brazzaville	Hospital beds:	4538 or 1:190

GENERAL

Geography and topography. The Republic of the Congo (Brazzaville)*, an elongated state with an area of 133,500 square miles, lies across the Equator in a northeast-southwest direction. It is bounded on the west by Gabon and on the north by Cameroun and the Central African Republic. To the east and south, it borders the Republic of the Congo (Leopoldville) and in the southwest, the coast-line extends for about 100 miles on the Atlantic Ocean. To the south near the ocean, it also touches the small Portuguese territory of Cabinda (Angola). Extending inland from the coast for about 40 miles is a sparsely-settled low-treeless plain with scattered lagoons. Paralleling the coast is a mountainous region known as the Mayombé Escarpment with ridges ranging in altitudes from 1600 to 2600 feet. Farther inland is the savannah-covered valley of the Niari River, one of the most fertile parts of the country, and a hilly region with wooded areas near Brazzaville. To the north of this lie the grassy Batéké Plateaus and savannah land, and beyond this, the dense tropical forest of the Congo-Ubangi River system.

Population. The estimated population in 1963 was about 850,000 inhabitants of whom more than 10,000 were Europeans. Forty per cent of the population was under the age of 15. The density for the entire country averages six persons per square mile. However, as in the other equatorial states, the population is unevenly distributed. Close to three-quarters of the inhabitants live in the southwest section of the Congo which covers only a third of the total land area. The population density of the Brazzaville area is 44 persons per square mile and on the coast, it averages 15. The forest zones of the north and the Batéké Plateaus are practically uninhabited, averaging about one person per square mile. There are over 5000 villages but a quarter of the population live in the three main urban centers. Brazzaville, the capital, has a population of 133,700 (1961 census); Pointe-Noire, a port on the Atlantic and the commercial center, has 80,000 (1962 census); and Dolisie 12,600 (1961 survey). The rural population represents around 500,000 persons. The African population is composed of about 15 ethnic groups divided among some 70 tribes.

According to a demographic study (1960) the natural increase of the population for the period 1960-1985 was expected to be 1.6 per cent per year. By 1985, the total population of the Congo would reach 1,190,000, the school-age population (6-14 years of age) 252,000 and the active male population (15-59 years of age) 315,000.

Government. The Congo voted to join the French Community and became the Republic of the Congo on November 28, 1958. Father Fulbert Youlou was elected

*Unless otherwise indicated in this section, the Congo refers to Congo (Brazzaville).

as Prime Minister and later as President of the Republic. The Congo proclaimed its independence on August 15, 1960. In August 1963, the government was overthrown principally by discontented workers led by heads of the trade unions and the Army. After unsuccessful negotiations with labor and Army leaders, President Youlou was forced to resign. The Congolese National Army took over pending the establishment of a new constitution and government. The National Assembly was dissolved and an eight-man provisional government was named with Alphonse Massamba-Debat as Prime Minister. Under the new constitution, approved by referendum in December 1963, provisions were made for executive, legislative, and judicial branches. On December 19, 1963, Mr. Massamba-Debat was elected President by universal suffrage for a five-year term.

The Congo is divided into 15 prefectures comprising 43 subprefectures and 3 administrative control posts. Five municipalities are Pointe-Noire, Dolisie, Jacob, Brazzaville and Ouessou.

In January 1965, the Council of Ministers decided to make each minister responsible for a particular section of the Congo where he would familiarize himself with the problems of the people and be in touch with the local administration. He would then report back to the Council on any administrative, economic or political problems pertaining to his assigned zone.

The Congo maintains close political and economic relationships with the other three equatorial states and with Cameroun as a member of the Customs and Economic Union of Central Africa (UDEAC). She is also a member of the Conference of Heads of State in Equatorial Africa, an associate member of the European Economic Community (EEC), a member of the United Nations and its specialized agencies, and a member of the OAU and the OCAM and the OCCGEAC.

In August 1965, the United States withdrew its diplomats from the Congo in protest against official mistreatment of American personnel.

Education. In 1965, the government allotted 16 per cent, or \$5.9 million, of the operational budget for national education. In 1961-1962, 80 per cent of school-age children (6-14 years of age) were enrolled. The number of pupils in the primary grades totalled 135,207, of whom 59,667 were in 220 public schools and 75,540 in 275 private schools maintained by missionaries. (The private or church schools were recently nationalized by the government and a number of missionaries left the country.) There were 10 secondary schools with a total of 5762 students, 4234 in public schools and 1528 in private ones. Two-thirds of the 1721 students in technical schools attended public institutions.

Efforts are being made through the Ministry of National Education to improve the school curriculum and to raise the level of teaching. Plans are under way to increase the number of classrooms in the primary grades and to add additional courses, such as basic agriculture, manual trades and home economics, in the secondary schools. There are four teacher-training schools with a total capacity of 673 trainees and a new one is to be created to accommodate 150 teachers per year. Special courses will be added to the existing teacher-training schools.

There were 388 students in higher education in the Congo. The Center for Higher Education, which will become the new university (Centre universitaire de Brazzaville), opened in 1959 in Brazzaville, offers advanced studies leading to degrees in the arts, sciences and law. The Center of Administrative and Advanced

Technical Studies maintains an Institute of Administrative and Judicial Studies, a small advanced school for teachers, a medico-social section and a school of arts. It accepts students from the other equatorial states who are unable to pursue their university studies in France. For the 1962-1963 term, the Center had 370 students. In December 1965, the cornerstone of the new university was laid by President Massamba-Debat.

In 1962-1963, 427 Congolese scholars were studying in France, 116 of these were charged to FAC.

ECONOMIC RESOURCES

Various estimates have been made for the gross national product (GNP) and per capita of the Congo. A recent American publication gives the GNP as \$45 million with a per capita income of \$50. Another source estimated the GNP as \$144 million with \$150 per capita in 1963. A French publication states that the average per capita of \$77 in 1963 will be increased to \$97 by 1968. No recent figures on the working population could be found in the literature. In 1958, the active population was believed to be around 440,000 persons with 85.2 per cent engaged in agriculture, stockraising and fishing, 3.4 per cent in mining and industry, and 11.4 per cent in administration, commerce, transportation, etc. The number of salaried personnel is around 70,000, 50 per cent of whom are in the last group mentioned above. The government faces a serious unemployment problem.

Although the economy of the Congo is essentially agricultural, 75 per cent of the products are raised for local consumption. This, however, contributes more to the gross national product than the cash crops but little to the country's exports and national revenue. Part of the Five-Year Plan (1964-1968) stresses agricultural development by increasing the commercial production of cash crops, in particular, peanuts, palm oil, rice, coffee and cocoa. Other cash crops are bananas, tobacco and sugar cane. Food crops consist mainly of manioc, sweet potatoes and yams, corn, pineapples and citrus fruits. Truck farming has been encouraged around the urban centers, and experimental farming is being carried on in the fertile Niari Valley region.

A new breed of cattle, resistant to sleeping sickness, was introduced into the Congo, but meat production has not been sufficient to satisfy the local demands and at least 90 per cent of the beef is still imported, mostly from Chad.

The forests, covering nearly half the area of the Congo, are its main source of income and wood and wood products accounted for more than 40 per cent of its exports in 1964. The Congo is the world's largest producer of limba (Terminalia superba), most of which is exported to West Germany for the manufacture of furniture. Other woods exported are okoumé and mahogany. Recognizing the potential value of this resource to the economy of the country, the government is encouraging further development of the untapped forest areas.

Most of the fishing is done along the ocean front and river banks but numerous family fish ponds exist. The catch is used mainly for the local diet but some tuna is exported.

Potash and petroleum are the main mineral commercial potentials. Plans are under way for the exploitation in 1967 of a recently discovered potash deposit. Except for this deposit, mining is operated by private investors but development

of the industry as a whole has been hampered by the meager resources and lack of transport. Other mineral deposits in the Congo are iron, lead, zinc, copper, gold and tin.

Many of the industrial installations are small and privately owned. Some of the larger enterprises are controlled by foreign investors. France, the United States and Israel have some private investment in the Congo. Industrial activities include food processing plants (30 palm, palmetto and peanut oil mills, sugar refinery, two fish canneries, rice mills, a brewery, a plant for manufacture of soft drinks, and a flour mill), textile factories, 16 sawmills, plywood and veneering plants, a cigarette factory, plants for the manufacture of plastic articles, furniture and shoes, metal and tin works, liquid gas factory, paint installation, two soap factories, public and private construction companies and a small shipbuilding and repair shop in Pointe-Noire. Plans are under way for development of a cement factory and possibly a pineapple cannery.

Land communications in the Congo are poorly developed. The road system is exiguous. The 320-mile Congo-Ocean Railway runs between Pointe-Noire and Brazzaville. A mining corporation in Gabon completed a 178-mile railway, to transport manganese ore from Gabon, starting at M'Binda near the Gabon border and connecting with the Congo-Ocean Railway about 15 miles east of Dolisie.

One economic asset of the Congo is known as The Federal Route which is the main transit for Equatorial Africa. This involves road transportation from Fort Lamy (Chad) to Bangui (CAR), a river stretch to Brazzaville, and the railway from there to the commercial port of Pointe-Noire in the Congo.

A 15,000 kw hydroelectric station, near the Djoué dam a few miles outside of Brazzaville, provides the main source of power to the capital. Pointe-Noire and Dolisie each has a centrally-generated electrical system. Elsewhere diesel motors are used to generate electrical current. Plans for the hydroelectric installation on the Kouilou River are in progress.

Exports in 1964 were valued at \$48 million with Belgium/Luxemburg the main client. France received about 15 per cent of the exports and the United States less than 1 per cent. For the same year, imports totalled \$73 million with France supplying 50 per cent and the United States 7 per cent. Diamonds which are not mined in the Congo cross the border from Kasai and are re-exported from the Congo. Since 1962, these stones had been its most valuable export but in 1964, wood and wood products were slightly higher in export value. Other products exported are petroleum, coffee, cocoa and palm oil. Imports are foodstuffs, agricultural and industrial machinery and consumer goods. In 1964, the Congo imported \$1.5 million in pharmaceutical products.

NATIONAL BUDGET

In 1965, the Congo's estimated budget totalled \$40.8 million of which \$36.6 million was for operating expenses. Health services account for 8 per cent, or \$3 million, of the operating budget. Based on an estimated population figure of 850,000, the average per capita for health services was \$3.60. The following table gives budget data for the last five years (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$26,848	\$25,316	\$1,835	7	\$2.15
1962	31,380	30,170	2,260	7	2.65
1963	36,947	36,299	2,727	8	3.20
1964	39,180	34,154	2,880	8	3.40
1965	40,790	36,550	3,077	8	3.60

*Based on an estimated population figure of 850,000.

The estimated budget for 1966 includes \$45.2 million for operating expenses and \$16.6 million for investment. The investment budget involves a large economic development program of which nearly \$100,000 is allocated for public health.

ASSISTANCE PROGRAMS

Bilateral. From 1959 through 1964, French investment credits from FAC amounted to more than \$20 million. As of December 1, 1964, 475 French technical cooperation personnel were serving in the Congo of whom 269 were in education and 85 in health. French investment in the health activities of the Congo through FAC from 1959 to February 25, 1964 amounted to \$1.9 million, or about 11 per cent, of the total FAC investments in the Congo during that period. These commitments pertained to the maternity clinic at Pointe-Noire (\$568,400); the Dolisie maternal and child health center (\$101,500); the Brazzaville Hospital (\$40,600); rural medical equipment (\$629,300); and the campaign against the endemic diseases (\$649,600). The 1964 FAC commitment for health projects was \$154,000 of which \$122,000 is for the campaigns against the endemic diseases.

U.S. AID technical assistance projects in the Congo for the past three fiscal years, 1963, 1964 and 1965 have related to the following categories: food and agriculture, power, transportation, education and technical support. No amount was allocated for health and sanitation activities. American aid however was suspended around the end of 1964.

The United Arab Republic made loans in 1965 of \$8.1 million for construction of a 100-room hotel in Brazzaville and \$850,000 for building sites for maternal and child health centers and two technical colleges. Israel made agreements for technical assistance to the Congo. A private Israeli company will participate jointly with the government in the development of a cotton textile industry. A cement factory is under construction with a loan from West Germany of \$2.5 million. The United Kingdom agreed to finance several industrial projects including a bottle factory at Pointe-Noire and a bamboo pulp factory in the Niari Valley.

Assistance also was given by some of the Communist countries with which the Congo has established diplomatic relations. In 1964, the USSR signed an agreement to aid in the construction of a central hydroelectric plant, the building of a 120-room hotel in Brazzaville and the exploration and evaluation of various mineral deposits. A loan of approximately \$8.88 million* was granted by the

* Conversion of 8 million rubles based on USSR official parity as given in UN Bulletin of Statistics, .9 rubles = US \$1.00.

USSR. The USSR also provides technical experts and offers training in the USSR. The Red Cross of the USSR gave materials and medical supplies for the refugees from the Congo (Leopoldville). Communist China signed a technical and economic agreement with the Congo to provide credits in the amount of \$20 million for a hosiery factory in Brazzaville, the creation of a model farm for the cultivation of cotton, the installation of a palm-oil refinery, processing of fish, rice growing and the improvement of the radio station in Brazzaville. Chinese technicians and experts will be available to assist in carrying out the activities. Part of the loan will be in currency and the remainder in materials. An agreement was also signed with Communist China for the construction of a textile mill which will employ some 1800 workers. Czechoslovakia signed a technical and scientific accord involving the exchange of experts and the training of students in Czechoslovakia. North Korea is aiding in building a polytechnic school in Brazzaville and a match factory in the Likouala District.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in the Congo totalled \$18.7 million for 17 projects. Of this amount, health and sanitation projects amounted to \$3.4 million, of which \$2.9 million was allocated for a sanitation project in Brazzaville and \$457,000 for 9 maternal and child health centers and 10 maternity dispensaries (total 216 beds) (see Table 3, Volume I). A more recent report (November 1964) indicates that the amount earmarked for the maternal and child health centers was increased to \$883,000. Other commitments involved transportation, bridges, ports and schools.

Project costs of the United Nations Expanded Program of Technical Assistance for the Congo in 1964 totalled \$151,302. These included \$59,061 allocated from the UNTA for natural resources development and power, and transport and communications; \$12,827 from ILO for social security and labor conditions and administration; \$40,553 from UNESCO for education and teacher training; FAO provided a short-term consultant on forestry development and WHO equipment and supplies for rural health services. Ten experts or technicians were involved in these projects and 19 fellowships were awarded nationals.

The Governing Council of the UN Development Program/Special Fund earmarked at its first session (January 1966) about \$2,737,000 of which \$1,064,000 is for survey and development of pelagic fish resources (FAO), \$776,000 for mineral exploration in the southwest (UN) and \$897,000 for forestry training and demonstration center at Mossendjo (FAO). It also earmarked \$733,000 for an inland fishery project of interest to the Congo, Gabon, the Central African Republic and Cameroun.

WHO commitments for 1965-1967 of \$232,000 and \$144,000 of other obligations relate to the malaria pre-eradication program, rural health services, training of laboratory technicians and fellowships (see Table 29).

UNICEF provided funds for projects related to maternal and child health, leprosy control, mothercraft and homecraft and education (see Table 30).

Since 1952, the headquarters for the WHO Regional Office for Africa has been located in Brazzaville. The French Government constructed the building which now houses the Regional Office and placed it at the disposal of WHO in 1956.

ORGANIZATION OF HEALTH SERVICES

Health activities were administered by the State Secretariat for public

health and population until late 1962 when it became the Ministry of Public Health, Population and Social Affairs. (The Minister: Mr. Simon Gokana.)

Medical and paramedical personnel include 51 physicians, 6 surgeons, 75 nurses with diplomas and 926 nurses aides, 14 pharmacists, 4 dentists, 19 midwives, 3 assistant midwives, and 5 health inspectors. As of September 1, 1965, 43 physicians were detailed to the Congo by the French Ministry of Cooperation. The doctor/population ratio is about 1:15,000.

Generally physicians receive their medical training abroad. In 1963, six medical and paramedical students from the Congo were studying in France and two at the Faculty of Medicine and Pharmacy at the University of Dakar.

Under the public health plan being developed with assistance from WHO, efforts are being made to improve and strengthen the training for medical and auxiliary health personnel in the Congo. One hundred and thirty-three students were enrolled in the school for nurses and midwives in Brazzaville in 1964 and 29 nurses, 5 midwives, 6 social workers and 5 health inspectors were graduated in the June class. For the 1964-1965 term, 80 nurses, 25 midwives, 36 social workers and 32 health inspectors were expected to be enrolled. Trainees are accepted from neighboring states. The school for medical auxiliaries at Pointe-Noire has 60 students.

Medical facilities include 2 large general hospitals, one in Brazzaville (834 beds) and the other in Pointe-Noire (620 beds); 15 medical centers; 25 infirmaries; 79 dispensaries; 30 maternity clinics; 9 maternal and child health centers; 10 rural medical posts equipped with mobile and X-ray units; 3 private polyclinics; 29 private dispensaries and other health units; 2 laboratories (Brazzaville and Pointe-Noire); a pharmaceutical supply outlet and a malaria prevention center both in Pointe-Noire; and the Pasteur Institute at Brazzaville. There are approximately 4538 hospital beds in the Congo or 1 bed to every 190 inhabitants.

In 1965, WHO gave an X-ray mobile unit to be used in the mass examinations for tuberculosis and the government opened a tuberculosis dispensary in Brazzaville.

The Endemic Diseases Service, which is divided into four sectors, carries out mass vaccination campaigns with its mobile units, in addition to their other activities which include case-findings of endemic diseases and the treatment of trypanosomiasis, leprosy and treponematosis.

PUBLIC HEALTH PROBLEMS

According to a WHO report, communicable diseases most frequently reported in 1961 were: malaria, yaws, syphilis, vesical bilharziasis, pneumococcal infections, tuberculosis (all forms), amoebiasis, influenza, and leprosy. Those mostly affecting the children were: measles (causing 56 deaths), mumps, chickenpox and whooping cough. In 1961, 303 cases of poliomyelitis were recorded and 24 in 1962.

The major public health problems are malaria, yaws, tuberculosis and bilharziasis. Malaria is the most serious and widespread endemic disease. A survey *

* Adam, J.P., Progent, A. and DeMellier, M. Organisation actuelle et problèmes de la lutte antipaludique à Brazzaville. *Med. Trop.*, 24(4), pp. 437-46, 1964.

made in 1963 has shown the persistence of malaria transmission in suburban areas of Brazzaville. Few Anopheles gambiae were found inside the sprayed houses in the urban areas but higher densities were found in the unsprayed districts outside the town. In spite of the control measures used in Brazzaville, not less than 11,417 cases of malaria were reported in the town dispensaries and child health centers during that year.

A campaign against yaws was conducted in January 1960 and out of 632,790 persons examined, over 7000 cases of yaws were found and treated. The disease is prevalent in the northern and southwestern regions.

A limited bilharziasis survey* was conducted in 1962 with the assistance of WHO. The preliminary findings seemed to indicate that Schistosoma haematobium is more common than S. mansoni. The presence of S. haematobium appears to be restricted mainly to areas in the western part of the country, especially around Jacob and Dolisie. There is the possibility that S. mansoni could be endemic around Dolisie. Recent survey data relate to the foci of urinary bilharziasis of Dolisie and Kayes (infection over 50 per cent of those examined). In 1961, 1641 cases of bilharziasis (1632 with S. haematobium infection and 9 with S. mansoni) were reported from hospitals (not including the two large general hospitals) and medical centers throughout the country.

Mass examinations for tuberculosis and plans for a control program are being initiated. There is only one specialized service with 84 beds. Isoniazid, streptomycin and PAS are used. The leprosy control program began in 1956. Of 16,243 registered cases in 1961, 7545 were under treatment and in 1964, out of 17,431 registered cases, 8779 were under treatment and 4218 under observation without treatment. There are 50 fixed treatment centers but the program is generally carried on by the circulating mobile vehicles. As a result of the vaccination campaigns, yellow fever is absent, and the incidence of smallpox is declining. However, in 1963, there were still 1515 known cases, 196 in 1964 and 81 cases in 1965. Immunization programs have also been carried out for diphtheria, poliomyelitis, tetanus, and typhoid and paratyphoid. Partially due to the high humidity in the Congo, various forms of respiratory and rheumatic diseases are prevalent.

There is a low-grade endemicity of trypanosomiasis throughout the country, but the principal focus is in the savannah zone, between Djambala and the Congo River. In 1961, the last year for which figures have been received (for this report) mobile prospection teams examined 431,741 persons and found 75 new cases. A total of 1372 cases remained under control at the end of the year.

Onchocerciasis is endemic. In 1946, in an operation of some magnitude undertaken by the Belgians, the Congo in the Leopoldville-Brazzaville area was freed from Simulium damnosum breeding, and transmission of onchocerciasis in this area was stopped. Recently, S. damnosum has returned at least to the spillway of the Djoué Dam, near Brazzaville.

* McCullough, Fergus S. Observations on bilharziasis and the potential snail hosts in the Republic of the Congo (Brazzaville). Bull. Wld. Hlth. Org., 30(3), pp. 375-388, 1964.

Table 29

Estimated WHO Commitments in Congo (Brazzaville), 1965-1967

<u>Project</u>	Number of Posts			Estimated Obligations		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	2	2	2	\$ 11,581	\$ 27,125	\$ 31,046
Rural health services	3	3	3	34,883	43,413	44,924
Training of laboratory technicians, Brazzaville	-	-	1	2,500	-	12,279
Fellowships	-	-	-	<u>8,000</u>	<u>4,000</u>	<u>12,000</u>
Total	<u>5</u>	<u>5</u>	<u>6</u>	<u>\$ 56,964</u>	<u>\$ 74,538</u>	<u>\$100,249</u>
Other obligations				\$ 1,000	\$ 84,000	\$ 59,000
Total estimated Government Contributions				44,500	44,500	

MALARIA PRE-ERADICATION PROGRAM (- 1972). To develop a network of basic health services on which a malaria eradication program for the whole of Congo (Brazzaville) can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

RURAL HEALTH SERVICES (1964-1968).* To assist in organizing health services, with emphasis on maternal and child health, tuberculosis control, environmental health, health education and nutrition.

The public health adviser was assigned to the project in March 1965.

Assistance in the field of tuberculosis control has begun within the framework of the project's over-all aims and purposes. A mass X-ray unit, with a certain amount of equipment, was delivered early February 1965, for use in the case-finding program within the national tuberculosis control efforts. The arrival of this equipment coincided with the Government's opening of a tuberculosis dispensary in Brazzaville. This equipment is being used for the training of national technicians under the supervision of a WHO X-ray technician, who reported for duty in Brazzaville at the end of January 1965.

* This project receives UNICEF assistance.

TRAINING OF LABORATORY TECHNICIANS (- 1970). To assist in the organization of a course for laboratory technicians in collaboration with the Pasteur Institute, Brazzaville. It is expected that nations of other French-speaking countries in equatorial Africa will attend.

OTHER WHO PROJECTS

LEPROSY CONTROL.* To assist leprosy control activities.

The project continued operation of case-finding treatment and surveillance of patients during the year. At the end of December there were 13,442 patients under treatment and 4625 under observation without treatment.

A consultant visited the leprosy control project for one and a half months. He found that one secteur was running well under the supervision of a medical officer, but in others surveillance of patients and regularity of treatment was not very good. He advised that every effort should be made for the treatment of lepomatous cases in order to sterilize the reservoir and source of infection.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular budget was allocated by MESA for the years 1965 to 1967 successively \$3000, \$4000 and \$4000.

* This project receives UNICEF assistance.

Table 30

UNICEF-Aided Projects in Congo (Brazzaville), 1960-1964

Total allocation: \$266,000

MATERNAL AND CHILD HEALTH (MCH)	Approved 1963
	\$ 33,000

UNICEF is providing audio-visual and reproduction equipment, teaching material, kits for midwives and public health nurses and transport in connection with the nurses' and midwives' school at Brazzaville and the medical auxiliaries' school at Pointe Noire.

LEPROSY CONTROL	Approved 1960-64
	\$ 28,600
	Additional commitment 12,000

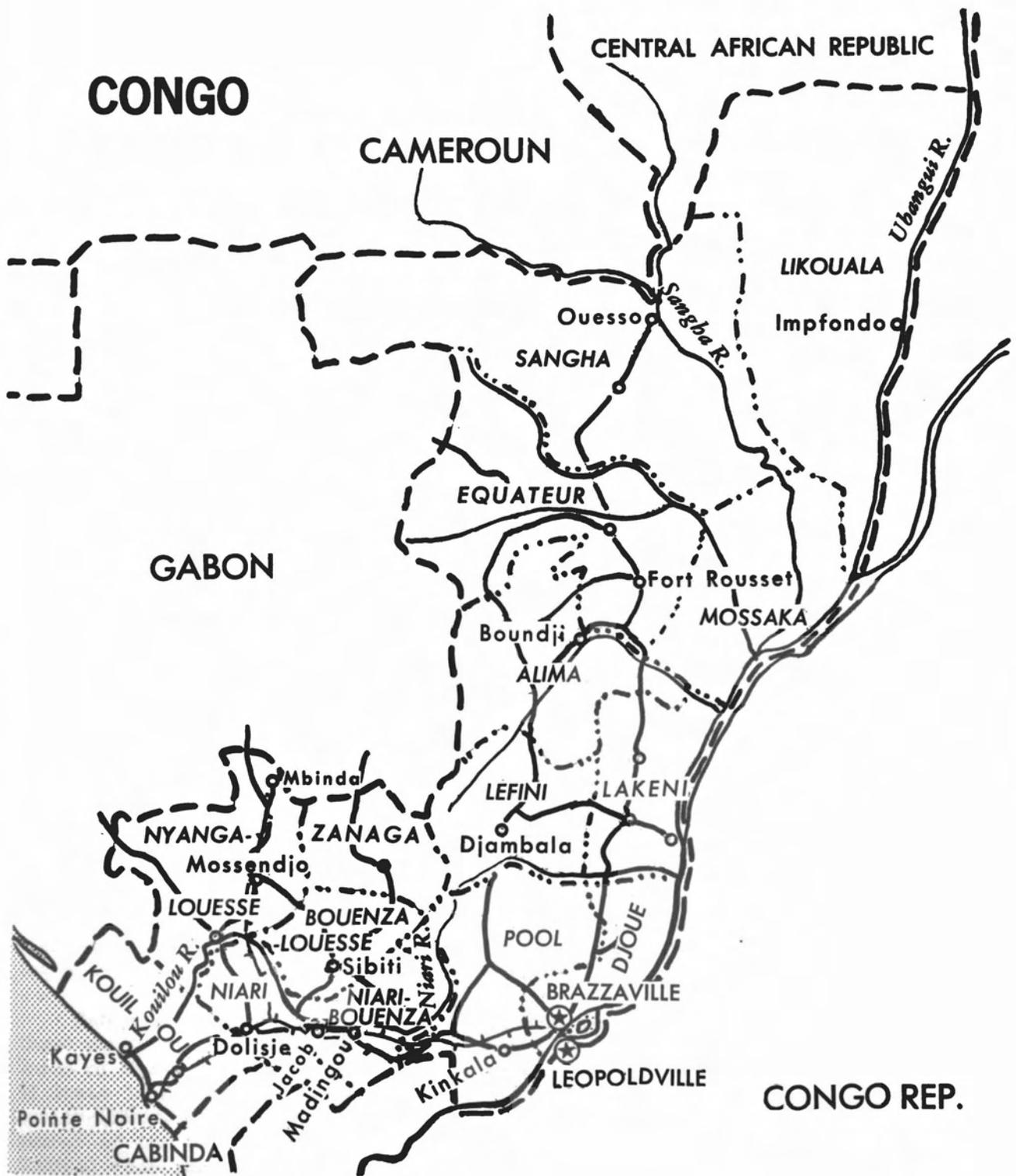
UNICEF is providing drugs, equipment and transport.

MOTHERCRAFT AND HOMECRAFT	Approved 1962
	\$ 102,500

In connection with the training of primary school and domestic science teachers, and women leaders for teaching homecraft and mothercraft, UNICEF provided training and demonstration equipment, transport and salaries for teachers. FAO provided an adviser in home economics and a fellowship in domestic science. UNICEF will provide supplementary equipment for the two home economics schools and stipends for 400 students. FAO expert in home economics is advising in this project.

EDUCATION	Approved 1964
	\$ 101,600
	Additional commitment 206,000

UNICEF is providing equipment and teaching material for 3 lycées, 3 teacher-training schools and 23 colleges and technical schools and for 350 primary schools; and 16 vehicles. It will finance the services of an expert and 3 science teachers provided by UNESCO. FAO will provide technical advice on basic agriculture and home economics teaching.



GABON REPUBLIC

Population:	630,000	Number of doctors:	79
Area:	102,290 sq. mi.	Doctors per population:	1:8000
Capital:	Libreville	Hospital beds:	3667 or 1:170

GENERAL

Geography and topography. Gabon, the smallest and least populated of the former French equatorial territories, is located on the western coast of Africa astride the equator. Rio Muni (Spanish Equatorial region) lies on the northwest corner of Gabon and to the north is Cameroun. On the east and south, Gabon is bordered by the Congo (Brazzaville) and on the west by a coastline of some 500 miles of the Atlantic Ocean. It has an area of 102,290 square miles and three-quarters of the country is covered by tropical forests with a few scattered savannah areas. The coastal lowland, with extensive mangrove swamps, varies in width from 20 to 120 miles. Beyond this, plateaus with altitudes ranging from 1000 to 2000 feet extend inward to the northern, eastern and southeastern sections of the country. Rivers have cut deep valleys into the face of the plateaus. The rest of the country is broken by mountains, with the highest peak, Mount Iboundji, in the central part of Gabon rising to 5165 feet.

Population. In 1964, the total population was estimated at 630,000 (including 5000 Europeans) with an average density of six persons per square mile. However, the distribution is very uneven. In addition to the few urban centers, the greatest concentrations of population are near the waterways and lumbering and mining regions. In the mountain and forest areas, the country is practically uninhabited. The two principal municipalities are Libreville, the capital, with an estimated population in 1964 of 30,000 and Port-Gentil, the main port, with about 20,000 inhabitants. The four other communes are Mouila (4200 pop.), Lambaréné (3700), Oyem (3000) and Bitam (2100). The rural population numbers approximately 543,000 persons, most of whom live in the 4503 small villages averaging 120 inhabitants each. The African population is composed of 40 different ethnic groups.

Government. Gabon joined the French Community and became a Republic on November 28, 1958; it proclaimed its independence on August 17, 1960 and Leon Mba was elected to the presidency. Gabon is a democratic republic with separation of the legislative, executive (both elected by universal suffrage), and judicial branches. Administratively, the country is divided into 9 prefectures, comprising a total of 28 subprefectures or districts.

Gabon maintains close political and economic relationships with the other three equatorial states and with Cameroun as a member of the Customs and Economic Union of Central Africa (UDEAC). She is also a member of the Conference of Heads of State in Equatorial Africa, an associate member of the European Economic Community (EEC), a member of the United Nations and its specialized agencies, and a member of the OAU and the OCAM. It is also a member of the newly established OCCGEAC (see page 30).

Education. Gabon has one of the most advanced educational systems of the French-speaking states. The first schools were started by missionaries and today

more than half are catholic and protestant establishments. In 1964, there were about 70,000 students in 850 elementary schools, 4000 students in 29 secondary schools, 1000 in 18 technical schools, and 600 in 11 schools for teachers and other establishments, making a total of 75,600 students or approximately 80 per cent of the school age population. The Institut Gabonais d'Etudes Juridiques has about 124 students.

In 1964, there were 1639 personnel connected with the primary grades, 210 teachers in the secondary schools, a large percentage of whom were European, and 83 professors or instructors in the technical schools.

The literacy rate is estimated to be between 5 and 10 per cent.

Realizing the importance of education in the future development of Gabon, emphasis is being placed on a teacher training program and on technical education. Of the 1000 students in the technical schools, 750, as compared to 566 in 1963, are pursuing studies in secondary technical teaching.

France provides scholarships and loans for qualified students desiring higher education in the universities and scientific and educational institutions of France. Training programs have been established and assistantships are available to them in research institutes. There were 214 students in 1964 following advanced studies outside of Gabon, most of them in France.

The Foundation for Higher Education in Central Africa, which has its administrative headquarters in Brazzaville and functions with French assistance, has integrated the institutions of higher learning under the authority of the Ministers of National Education in each of the four equatorial states. The Polytechnic Institute (public works, electricity and mechanics) in Gabon will operate under this Foundation (see page 128). The Foundation provides grants and allowances to students studying in universities of member states of the OCAM; Gabon assists its own students by supplementing the amount of money accorded by the Foundation.

ECONOMIC RESOURCES

A rather wide variance in GNP and per capita income estimates for Gabon have been published. According to one American source, the GNP was \$90 million with a per capita income of \$200 in 1963, while another publication (1965) gives the GNP as \$51 million with a per capita of \$110. A recent French report states that the average per capita income rose from \$170 in 1960 to \$243 in 1964. Nearly 70 per cent, or 359,000 persons (including both sexes of working age), of the rural population are engaged in agriculture, mostly of a subsistence nature. Wage earners, which include miners, forest and plantation workers, number 48,600; tradesmen and artisans about 8200; civil servants 3400; and others, including the military, clergy, etc., about 38,200.

Because of the abundance of natural resources, Gabon has placed emphasis on industrialization rather than agriculture in its economic development program. A Five-Year Plan for 1965-1970, still in the preparatory stage, will become effective on January 1, 1966. The interim plan of 1963-1965 stressed economic infrastructure and studies in the field of production, industrialization and social equipment.

The exploitation of the vast forest areas are the basis of Gabon's economy and the main source of national revenue. Most of the lumber is exported in the form of logs; the rest is processed in sawmills and plants. The most valuable wood marketed is okoumé, used principally in making plywood. Gabon's second source of wealth derives from the rich mineral deposits. Production of manganese started in September 1962 when the mines at Moanda were opened. By the end of that year, exports reached 100,000 tons valued at \$2.3 million. U.S. Steel holds 49 per cent of the capital in the developing company; the remainder is held by the French government and French private interests. One of the richest iron deposits in the world, estimated at 1 billion tons of high grade ore, is being developed at Belinga in the Mekambo region with half European capital and half from Bethlehem Steel. French interests control the deposits of uranium. Other resources are petroleum, natural gas, potassium, gold and diamonds. Lead-zinc and columbo-tantalite deposits have also been found.

Agriculture is mainly of a subsistence nature but efforts have been made in recent years to develop this part of the economy. Food crops consist mostly of cassava, bananas, cane sugar, yams and sweet potatoes and corn. Cash crops which have been introduced into Gabon are cocoa, the most important export crop, coffee, rice, peanuts, pepper and palm products.

Fish, although plentiful along the coast, are used only for domestic purposes. However, the government is endeavoring to develop a fishing industry. Whales are caught for the processing of oil.

The principal industry is the processing of lumber to produce plywood and veneer. In 1963, hardwood production reached 761,000 tons. At that time, there were 17 sawmills, 3 veneer factories and 1 plywood factory. Furniture is made for domestic use. In addition, there are 15 small factories for processing coffee, 4 palm oil refineries, rice mills, a soap factory and a plant which manufactures steel boats and barges. Now under consideration or in the process of realization are a paper pulp mill, a box and crate making factory, a railroad tie manufacturing plant, a brewery, a cement works, a sugar refinery, a confectionery firm, a brick factory, a textile complex and an explosives manufacturing plant.

With the availability of numerous rivers, the development of hydroelectric power is a great potential as a source of energy. At the present time, supply of electric power is provided mainly by diesel generators and natural gas and is centered around the coastal area. Construction of a dam on the Mvea River to supply electricity to the Oyem municipality is in progress. Plans are under way for a hydroelectric plant at Kinguele Falls, over 50 miles east of Libreville. Construction began in 1965 aided by RAC investment funds.

The road system in Gabon is little developed and many routes are unpaved. By mid-1964, the network of roads totalled about 4000 miles of which 1000 miles were national routes, 1440 miles of regional roads, 1250 miles of secondary roads and about 310 miles of private roads. The main highway of 540 miles crosses the country from north to south extending toward Douala (Cameroun) in the north and connecting with Dolisie (Congo) in the south. The two principal ports at Port-Gentil and Libreville handled about 1.9 million tons in 1963. However, there are no major facilities for ocean shipping. A few smaller ports handle logs. FED is financing a study (\$800,000) for a deep-water port at Owendo on which work is to begin in 1967. In connection with this project, a

railway of about 400 miles is also planned to transport iron ore from Belinga to Owendo. The capital cost is estimated around \$160 million. It is hoped that construction will begin in 1969 and be completed by 1974.

Gabon enjoys a favorable balance of trade. From 1960 to 1964 exports increased from \$47 million to \$89 million nearly doubling in value. For the same period, imports increased from \$31 million to \$56 million. In 1964, France received about 50 per cent and the United States around 13 per cent of Gabon's exports and supplied 60 per cent and 12 per cent, respectively. Wood in various forms is the main export with minerals second. Coffee, cocoa and palm oil are also exported. Main imports are food products, fabrics, machinery and equipment.

NATIONAL BUDGET

In 1965, Gabon's estimated budget totalled \$49.7 million. Of this amount, \$32.5 million was for operating expenses. Health services represented 9 per cent, or \$2.8 million, of the operating budget. Based on an estimated population of 630,000, the average per capita for health services was \$4.40. In 1963, the budget was augmented by the creation of a Development Budget. From this development fund, \$182,000 in 1964 and \$166,000 in 1965 were allocated for health and sanitary purposes.

The following allotments for personnel and services were included in the 1964 national health budget: Libreville Hospital: \$566,600; Port-Gentil Hospital: \$140,000; Mouila Hospital: \$99,300; Oyem Hospital: \$70,400; Ebeigné Leprosarium: \$85,300; medical centers: \$648,200; maternal and child health: \$54,130; trypanosomiasis centers (N'Kembo and Tchibanga): \$52,750; endemic diseases: \$248,000; nutrition mobile unit: \$20,350; tuberculosis campaign: \$24,300; School for Nurses and Midwives: \$105,500; and pharmacy supply: \$446,400.

The following table gives budget data for the last five years (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$26,663	\$23,494	\$1,963	8	\$4.35
1962	33,434	29,342	2,191	8	4.85
1963	45,924	29,161	2,619	9	5.80
1964	40,324	30,097	2,838	9	4.50
1965	49,703	32,523	2,777	9	4.40

*Based on estimated population figure of 450,000 for 1961, 1962 and 1963; 630,000 for 1964 and 1965.

The 1966 operating budget is \$32.4 million and the development budget about \$16.2 million.

ASSISTANCE PROGRAMS

Bilateral. From 1959 through 1964, French investment credits from FAC amounted to around \$20 million. As of December 1, 1964, 341 French technical cooperation personnel were serving in Gabon of whom 136 were in education and

63 in health. French investment in the health activities of Gabon through the FAC from 1959 to February 25, 1964 amounted to \$799,000, or about 5 per cent, of the total FAC investments in Gabon during that period. This assistance involved furnishings for the Libreville Hospital (\$103,000), equipment for the Ebeigné Leprosarium (\$42,000), rural medical equipment (\$62,000), the campaign against the endemic diseases (\$509,000), and the purchase of medicine and insecticides (\$83,000).

The United States aided in school construction through the Peace Corps, furnishing of materials and equipment for the pilot farms, technical schools and other public works, providing grants for scholarships, and assisting in the public health and veterinary programs. The U.S. AID program in Gabon for the fiscal years 1962, 1963 and 1964 is valued around \$1.9 million.

Assistance to the Endemic Diseases Service in improving health and sanitation facilities and in the expansion of the medical services is being given. U.S. AID cooperated with WHO in the study of a national health plan* (see page 79). In 1964, AID donated 4 ambulances and 4 scout cars to the health services and 8 jeeps to the animal husbandry service.

Private groups in Israel and in Spain are assisting in the development of factories. China (Taiwan) has provided specialists in rice cultivation. West Germany furnished \$20,000 in hospital material and equipment, assisted in the professional training of students and granted a loan for the development of roads.

Multilateral. From 1958 to June 30, 1964, FED credits to Gabon totalled \$13.3 million for 14 projects. Of this amount, \$2.1 million was invested in health and sanitation projects (see Table 3, Volume I). Other commitments during this period involved transportation, bridges, schools and development of livestock. Financial commitments to the health infrastructure, amounting to a total of \$1.2 million of the \$2.1 million, relate to 3 surgical suites, 23 hospital pavilions, 2 maternity clinics, 1 maternal and child health center, 1 dispensary and 1 nursing school for 30 students. Gabon has submitted a request to FED for funds in the amount of \$1.6 to \$2 million to be used for its public health program.

Under the United Nations Expanded Program of Technical Assistance, project costs in 1964 totalled \$212,992. Included in these costs was \$27,498 allocated by UNTA for projects involving the development of natural resources and economic programming; \$60,595 from ILO for manpower organization, social security and labor conditions and administration; \$71,894 from FAO for projects in the fields of agriculture and nutrition; and \$38,149 from UNESCO for education and teacher training. Fourteen experts and technicians were furnished for these projects and 11 fellowship grants were awarded to nationals.

The Governing Council of the UN Development Program/Special Fund recommended that \$3,415,000 be earmarked for the engineering study of the Owendo-Belinga railway (two years under IBERD) and \$996,700 for the National Forestry Institute at Cap Estérias (six years under FAO).

* Gabon: Plan quinquennal 1966-1980 de développement des services de santé. Ministère de la Santé publique et de la Population, Libreville, 1965.

WHO provides funds for malaria pre-eradication, tuberculosis control, environmental sanitation, maternal and child health, leprosy, nursing education and the national health laboratory (see Table 31).

UNICEF provided funds for projects related to the training of personnel for maternal and child health and training of sanitary agents, leprosy control, applied nutrition and child feeding and education (see Table 32).

The World Bank provided a twenty-year loan for the construction and improvement of roads.

ORGANIZATION OF HEALTH SERVICES

The Ministry of Public Health is responsible for all public health and medical matters with the exception of some curative services under other Ministries (Labor, Armed Forces). The Minister is assisted by a technical adviser and the Director of Public Health, head of the Direction de la Santé publique.

The Director has under his direct authority the schools of nursing and midwifery and other matters relating to training of personnel and two new units set up in the directorate: the Nutrition Section organized with the assistance of a FAO adviser (in 1962) and the Sanitation Section under a sanitary engineer provided by WHO (in 1963).

The Directorate of Public Health comprises four bureaus of which the most important is the Technical Bureau dealing with all matters of preventive and curative medicine and technical relations with international organizations. The other three bureaus deal with (1) personnel, (2) finance and administration, and (3) drugs and supplies. The Directorate is also responsible for all health services of the Libreville region. The Technical Bureau includes two heads of the major services: curative medicine and preventive medicine. The curative medicine service has under its technical authority the general hospital at Libreville, the regional hospitals, the Kong polyclinic, the leprosy hospital of Ebeigné, the sleeping sickness units of N'Kembo and Tchibanga, medical centers, infirmaries and dispensaries and the central laboratory. The preventive medicine service controls the mobile medical teams and deals with maternal and child health and local hygiene and sanitation services.

The Caisse de Prévoyance sociale (Social Insurance Fund) set up 5 dispensaries (with 5 physicians) in Libreville, Port-Gentil, Lambaréné, Mouila and Kango originally to provide medical assistance in work injury, but gradually extended the medical coverage to about 15,000 employees and their families accounting for 50,000 persons.

The peripheral health services include nine medical circonscriptions corresponding to the nine administrative regions. Each circonscription is under a regional medical officer responsible to the Director of Public Health. Each medical circonscription has its own mobile medical units under a medical officer responsible for the case-finding medical teams and the control of endemic diseases. However, in practice the regional medical officer is also in charge of a hospital or regional medical center and has little time to supervise district medical centers or dispensaries.

In 1964, medical facilities consisted of 5 general hospitals (at Libreville -

511 beds; Port-Gentil - 230 beds; Oyem - 150 beds; Mouila - 220 beds; and one private hospital at Lambaréné founded by Dr. Schweitzer), 27 medical centers (or secondary hospitals), 6 leprosy hospitals (of which 3 private), 2 sleeping sickness units, 1 polyclinic, 9 urban dispensaries (of which 5 are under the Social Insurance Fund), 59 rural dispensaries, 11 private dispensaries and 1 central pharmacy. There are approximately 3667 hospital beds, one for every 170 persons. Beginning January 1, 1966, the medical centers at Franceville, Koulamoutou, Lambaréné, Makokou and Tchibanga will become regional hospitals with their own budgets. There are 9 mobile health and prophylaxis units, one in each prefecture. Its equipment includes 6 ambulances, 10 trucks, 60 jeeps or Land-Rovers and 16 other cars and motor boats for transportation on the rivers.

With the support of UNICEF and WHO, the government of Gabon opened a maternal and child health training center at Libreville in 1962. Eighteen-month training courses are offered to health workers from the rural districts. A small laboratory is attached to the center.

In 1964, medical and paramedical personnel included 57 government doctors, 2 pharmacists, 3 dental surgeons, 71 nurses and 557 assistant nurses, 8 midwives and 5 assistant midwives. In addition, there were also 22 physicians not in government service. There were 835 Gabonais in health administration and 63 French technical assistants in health activities. As of September 1, 1965, 42 French physicians were provided by the Ministry of Cooperation. Based on an estimated population of 630,000, the doctor/population ratio is 1:8000.

Doctors and pharmacists must be trained outside of Gabon. In 1963, out of 15 students in the medical or paramedical field 11 were studying in France. In 1964, 24 medical students were studying outside of the country. During the 1963-1964 term, there were two students in the Faculty of Medicine and Pharmacy at the University of Dakar. Nurses, midwives and auxiliary workers are trained at the National School of Public Health (also called Ecole d'infirmiers et d'infirmières) in Libreville opened in 1960. In 1963, 51 students were graduated, including 5 nurses, 6 midwives and 40 auxiliary nurses and social workers. The school offers a two-year course for training sanitary agents. During the first year (1963) there were 8 trainees.

PUBLIC HEALTH PROBLEMS

In recent years some of the major public health problems have been tuberculosis, malaria, syphilis and yaws, leprosy, malnutrition, high infant mortality and intestinal worm infestation. With assistance from WHO and UNICEF, a survey on the incidence of tuberculosis was conducted. Malaria is one of the main causes of death. As a result of mass treatment campaigns, under the advice and guidance of WHO and with material assistance from UNICEF, yaws has virtually been eliminated. A leprosy control program, initiated in 1955, is being carried out in collaboration with WHO and UNICEF. However, lack of personnel has hindered the campaign. In 1961, there were 10,364 cases of leprosy with 7280 under treatment, and at the end of 1964 there were 10,629 registered cases with about 6000 under treatment. General nutritional surveys have been conducted with a view to the implementation of an applied nutrition program with the assistance of WHO, FAO and UNICEF.

Gabon's small population and high infant mortality rate are important problems facing the government. The need to reduce infant mortality and raise the standard of living is being stressed. Special efforts were made to improve and

expand the maternal and child care services. More than half the births are now attended by a physician or qualified midwife.

Except for one case in January 1965, no smallpox cases have been reported in recent years; mass vaccination campaigns are undertaken every three years. Systematic vaccination against yellow fever is also carried on. Although trypanosomiasis occurs in most parts, Gabon is all forest country and the disease was important only in the Estuaire sector, which includes Libreville. A new campaign of survey, treatment and prophylaxis was started in 1962, and trypanosomiasis has now practically disappeared. Onchocerciasis has not been surveyed, but presumably exists since Simulium damnosum is a pest in some places. Bilharziasis is known to be present.

Health problems of Gabon have been discussed in the Health Plan for the next 15 years* and priorities have been defined in three successive groups, summarized as follows:

(1) Training of personnel, health education and establishment of basic records (statistics and an individual health record card).

(2) Development of the public health policies including (a) in the Ministry: the creation of a Division of Epidemiology and Preventive Medicine, a Division of Public Health Laboratory and a Division of Environmental Health and Sanitation; (b) in the rural areas: (for children)—intensive preventive action aimed at reduction of infant mortality and improvement in the health of children (preventive vaccination, malaria prophylaxis, improvement of nutrition and environmental sanitation); (for adults)—action towards the control of malaria, helminthic diseases, treponematoses, gonorrhoeal infection, leprosy, tuberculosis and trypanosomiasis.

(3) Strengthening of the infrastructure by setting up a public health laboratory and developing the network of dispensaries and domiciliary services.

HEALTH DEVELOPMENT PLANS

The over-all Five-Year Plan, 1959-1964, was followed by a second Five-Year Plan, 1965-1970, which began on January 1, 1966. The Interim Plan of Development covering 1963-1965 gave priority to economic infrastructure, to studies in the field of production, industrialization and social equipment (see page 79).

Health was one of the components of the first Five-Year Plan, 1959-1964. In 1963, the Minister of Health presented his triennial development plan covering the years 1963, 1964 and 1965. This concerned modernization and equipment for the health services involving the construction of various pavilions, buildings and housing units in the hospitals and other medical facilities. Plans were also made to establish dispensaries in those rural areas where the need still exists and for expanding the mobile units of the Endemic Diseases Service.

The Health Plan for the next 15 years was prepared with the assistance of WHO and the U.S. AID and will be integrated in the over-all economic development plan.

* See footnote, page 329.

Table 31

Estimated WHO Commitments in Gabon, 1965-1967

Project	Number of Posts			Estimated Obligations		
	1965	1966	1967	1965	1966	1967
Malaria pre-eradication program	-	1	3	\$ -	\$ 20,061	\$ 45,217
Tuberculosis control	1	1	3	14,085	15,249	46,009
National health laboratory	1	1	1	11,621	12,886	19,935
National health planning	-	-	-	45,080	-	-
Nursing education	2	2	2	22,743	31,228	32,518
Maternal and child health	2	2	2	28,238	31,570	30,684
Environmental sanitation	1	1	1	14,638	18,252	21,679
Fellowships	-	-	-	-	-	4,000
Total	7	8	12	\$136,405	\$129,246	\$200,042
Other obligations				\$ 2,500	\$ 55,000	\$ 39,000
Total estimated Government Contribution				381,560	344,430	

MALARIA PRE-ERADICATION PROGRAM (- 1972). To develop a network of basic health services on which a malaria eradication program for the whole of Gabon can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

TUBERCULOSIS CONTROL (1965-1968). To assist in establishing a pilot area where a BCG campaign will be carried out and then to expand activities towards the development of a national tuberculosis control program.

It has not been possible so far to fill the post of medical officer. Supplies and equipment have started to arrive at the project site, Port Gentil.

NATIONAL HEALTH LABORATORY (1965-1968). To assist in the creation of a national health laboratory and participate in training auxiliary personnel.

A laboratory technician was recruited and took up his duties in April 1965.

NURSING EDUCATION (1962-1968). To assist with the development of basic programs for the education of nurses and midwives.

Assistance to the basic school of nursing for the training of state midwives, and nurses, and auxiliary nurses has continued. The construction of a new school building has been commenced. The WHO nurse educator works in close cooperation with a national nurse educator who returned from a WHO fellowship to the Ecole des Cadres, Marseille.

MATERNAL AND CHILD HEALTH (1961-1970).* To expand maternal and child health services within the framework of an over-all five year health plan. To continue assisting in staff training in order to establish rural health services on a regional and district level.

A maternal and child health medical officer reported for duty in August 1964. He undertook a survey of existing health facilities with a view to the subsequent planning of a national program.

Training activities continued and a rural training center was established near Libreville.

The WHO public health nurse educator continued the planning of a second year of practical training for auxiliary nurses in the maternal and child health service. Teaching of public health nursing theory and practice was provided for student nurses and midwives; the practical aspects included experience in the techniques of home visiting.

ENVIRONMENTAL SANITATION (1963-1968).* To assist in setting up a sanitation unit in the Ministry of Health; to train sanitation personnel and develop a long-term sanitation program.

The construction of the school at Libreville for health technical assistants has been completed. The eight first-year students have passed to the second year after successfully taking an examination in August 1964. An entrance examination was held for the recruitment of ten new first-year students.

The work in connection with extending the water supply for Libreville has begun. The training program for health assistants has suffered to some extent because of the absence of a WHO engineer and the lack of a national counterpart.

OTHER WHO PROJECTS

LEPROSY CONTROL (- 1966).* To assist the Government in an effective leprosy control program.

UNICEF continued to assist the leprosy control program. A WHO consultant visited the country in 1964 and reviewed the activities of the project in which 10,000 patients are registered, with 6000 under treatment and only 50 per cent under regular treatment. The consultant suggested that special efforts should be made to ensure the regular treatment of lepromatous patients in order to reduce to a minimum the reservoir of infection.

*This project receives UNICEF support.

NATIONAL HEALTH PLANNING (1963-1964).* To assist in formulating an over-all national health plan.

The WHO planner finished his survey and submitted a proposed plan to the Government. This plans for the development of health services to be spread over 15 years and included within the framework of the national plan for socio-economic development.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular budget was allocated by MESA for the years 1965 to 1967 successively \$30,121, \$4000 and \$6400 (3 posts in 1965).

* This project receives U.S. AID assistance.

Table 32

UNICEF-Aided Projects in Gabon, 1960-1964

Total allocation: \$227,000

MATERNAL AND CHILD HEALTH (MCH) AND ENVIRONMENTAL SANITATION	Approved 1960-64 \$ 29,900
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UNICEF provided equipment for two regional MCH training services at Libreville and Mouila; drugs, dried milk, equipment for 7 regional and 7 district health centers; clinical ward equipment for 3 maternity homes, nursing kits, midwifery kits, vehicles; stipends. WHO is providing services of two nursing experts and a MCH expert. FAO is providing a nutritionist. UNICEF is supplying equipment and training materials for the training school for sanitation agents at Libreville and equipment for a sanitation demonstration zone at Nkembo (near Libreville); vehicles and stipends. WHO is providing a sanitary engineer.

LEPROSY CONTROL	Approved 1960-64 \$ 31,000
	Additional commitment 14,500

UNICEF is supplying drugs, injection equipment and vehicles for the campaign. WHO will undertake an evaluation of the campaign.

APPLIED NUTRITION AND CHILD FEEDING	Approved 1962 \$ 116,900
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Project aims to improve nutrition through increased production of food-stuffs of good nutritive value and through a nutrition education campaign. The nutrition surveys are being carried out under an FAO nutrition expert and completed by clinical surveys to be made by a WHO consultant. UNICEF is providing technical and laboratory equipment for the Gabonese Bureau of Nutritional Planning and for 4 survey teams; equipment for 60 school gardens, and 15 canteens, supplementary foods for school feeding, vehicles and the salary of a home economist. FAO is providing a nutrition expert; WHO continues to give medical guidance and will provide a nutritional consultant (1965).

EDUCATION	Approved 1964 \$ 49,400
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A project to improve the quality of primary school teaching; training of 900 teachers in two years. UNICEF is providing audio-visual and reproduction equipment, libraries, teaching materials for eight pilot training schools and vehicles. UNICEF will also finance experts in teacher-training provided by UNESCO.





THE FEDERAL REPUBLIC OF CAMEROUN

Population:	5 million	Number of doctors:	183
Area:	183,567 sq. mi.	Doctors per population:	1:27,300
Federal Capital:	Yaoundé	Hospital beds:	10,868 or 1:460

GENERAL

Geography and topography. Cameroun is situated on the Gulf of Guinea just north of the Equator. It is bounded on the northwest by Nigeria, on the northeast by Chad, on the east by the Central African Republic, and on the southwest by the Atlantic Ocean. In the south, it touches Rio Muni (Spanish Equatorial Region), Gabon and the Congo (Brazzaville). The land area totals 183,567 square miles (of which West Cameroun is 16,581 square miles). At the southwest point of Cameroun, the low sandy coastal plain extends inland for a few miles, widening to almost sixty miles around the Douala area. West of Douala is Mount Cameroun (13,370 feet) from where a series of extinct volcanoes run in a northeasterly direction forming a natural border between East and West Cameroun. A tropical rain forest covers the southern part of the country. Above this is the central plateau region and the Adamawa Massif extending across Cameroun and into the Central African Republic. Beyond this, both wooded and grassy savannahs of the Benue Valley and marshy plains stretch toward Lake Chad.

Population. The population has recently been estimated to be around 5 million persons of whom 4.1 million live in East Cameroun, which has an average density of 22 inhabitants per square mile, and 900,000 in West Cameroun with an average density of 54. The over-all average density for Cameroun would be 27 persons per square mile. However, most of the population is concentrated in three areas: In the western highlands, in the southwest area around the urban centers of Douala and Yaoundé, and north from Benue to Lake Chad. Average densities vary from 260 persons per square mile in the Department of Wouri (Douala), 6-10 inhabitants on the Adamawa Massif (26,000 square miles), to less than 2 persons per square mile in the southeast forest region. Yaoundé, the capital of the Federal Republic and also of East Cameroun, has an estimated population of 93,000; Douala, the main port and commercial center, 150,000; Nkongsamba, 39,800; Garoua 30,000; and Ngaoundéré 15,000. The principal towns of West Cameroun are Buea, the capital, with 3000 inhabitants; Kumba 40,000; Tiko 26,000; Victoria-Bota 15,000; Bamenda 10,000; and Mamfé 10,000. There are an estimated 140 tribal groups in Cameroun.

Government. The Federal Republic of Cameroun was originally part of a German colony. After World War I, the larger part of the territory was mandated to France by the League of Nations and the rest to Great Britain. Following World War II, the mandates became United Nations Trust Territories remaining under French and British administration as before. On January 1, 1959, France granted full internal autonomy to her sector of Cameroun and relinquished its UN Trusteeship on January 1, 1960 when complete independence was proclaimed. The portion under the British administration held a plebiscite in February 1961 and the northern part voted to unite with Nigeria and the southern part, known as the Southern Cameroons, decided to join the Cameroun Republic. On October 1, 1961, the Southern Cameroons and the Republic of Cameroun united to form the Federal Republic of Cameroun. The former French trusteeship is known as East Cameroun or Cameroun oriental and the former British Southern Cameroons as West Cameroun or Cameroun occidental.

Ahmadou Ahidjo, formerly President of East Cameroun, was elected President of the Federal Republic.

The Federal Republic has a constitutional form of government providing for a President and a Vice President, a National Assembly and an independent judiciary. The National Federal Assembly is composed of 50 deputies, 10 of whom represent the western state. Yaoundé is both the capital of the Federal Government and of East Cameroun, while Buea is the capital of West Cameroun. East and West Cameroun each have a prime minister, designated by the President, and their own legislative assemblies composed of 100 and 40 members, respectively.

The Federal Republic is divided into 6 administrative regions and 35 departments, 29 in East Cameroun and 6 in West Cameroun. The eleven municipalities in East Cameroun are: Douala, Yaoundé, Nkongsamba, Sangmélima, Kribi, Ebolowa, Mbalmayo, Edéa, Bafang, Eséka and Bafoussam.

The former British sector had been governed as a part of Nigeria and therefore did not possess the prerequisites to govern itself. Gradually, the West has adopted the economic system of East Cameroun but has retained a special trading relationship with Great Britain. Both French and English have been adopted as the official languages of the Federation.

The Federal Republic has maintained close political and economic relationships with the Central African Republic, Chad, Congo (Brazzaville), and Gabon as a member of the Customs and Economic Union of Central Africa (UDEAC) (see page 25). It is an associate member of the European Economic Community (EEC) (see page 22), a member of the United Nations and its specialized agencies, and a member of the OAU and the OCAM (see page 22). The headquarters of the latter group is at Yaoundé. The newly-formed OCCGEAC (see page 30), similar to the OCCGE of West Africa, was established in April 1965 with headquarters at Yaoundé.

Education. In 1964-1965, the Federal operating budget of Cameroun provided \$3.2 million, or 4 per cent, for education, while East Cameroun allotted \$4.2 million, or 14 per cent, of its operating budget and West Cameroun, \$1.8 million, or 21 per cent.

Two school systems are in effect in Cameroun; East Cameroun follows the French system and West Cameroun the British. A study is being made with a view to reconciling the two systems.

In East Cameroun the average rate of enrollment is 67 per cent but ranges from close to 100 per cent in the south to little more than 10 per cent in the north. In 1962-1963, there were 2741 elementary schools (of which 2013 were private) with 437,300 students, 18,500 students in secondary schools, 5750 in technical schools and 650 in advanced schools, making a total of 462,200 students in public and private schools. In 1963-1964, 640 Camerounian scholars were pursuing studies in higher education in France. Of these, 456 were on fellowships, 298 provided by Cameroun and 158 charged to FAC.

During 1962-1963, West Cameroun had 590 primary schools with 95,159 students and 3157 teachers. Elementary education lasts for eight years and secondary education for five years leading to the West African School Certificate. Technical training is given at the Government Trade Center at Ombe which has been raised to the status of a technical college and has an enrollment of 186. Both Great Britain

and West Germany give scholarships to Camerounian students.

A school of agriculture at Wum will be constructed with aid from West Germany. Construction of a bilingual school at Buea and a teacher training college at Ngaoundéré will be financed by the FAC.

The predominance of private education is noted in Cameroun. Government budgetary allocation to private schools for subvention of salaries to teachers and instructors was increased from \$2.2 million to \$2.8 million in 1964. Catholic schools received \$1.7 million, Protestant schools \$.9 million, and other private schools \$.2 million.

At the University of Dakar, there were 54 students during 1962-1963 and 40 during the 1963-1964 term of which 10 and 9 students, respectively, were enrolled in the Faculty of Medicine and Pharmacy. In the 1964-1965 term, 8 out of 46 students were studying medicine.

The number of Camerounian students holding bachelor degrees justified the establishment of advanced educational facilities in Cameroun. Since the beginning (1961), the University of Yaoundé has offered two years of law school, a first year in the humanities, and courses leading to letters and science certificates. Under an agreement with France, the University of Yaoundé officially became a federal establishment in October 1962 based on an unusual system which permits the founding of chairs by other countries. Countries willing to cooperate can sponsor a chair and insure teaching in accordance with a teaching program approved by the Government. France has been entrusted with the teaching of law and the undergraduate courses in science and letters. France agreed to furnish a loan, to recruit and subsidize French teaching personnel, to aid in the investment costs (equipment and operations) and in the cost of personnel relative to the chairs under her responsibility. The University will have three faculties: law, arts, sciences; an advanced teachers college; a national school of agriculture; and a school of administration. In 1963-1964, there were 619 students studying at the University. Plans to create a faculty of medicine within the University are in progress. WHO is providing advisory services on the establishment of the school and of a teaching hospital center. (See page 133.)

ECONOMIC RESOURCES

One American source estimates the GNP for 1963 as \$400 million with a per capita income of \$92. Another publication gives an estimated GDP of \$550 million with a per capita income of \$112 for fiscal 1963. A recent French publication lists the per capita income for East Cameroun as \$87 and for West Cameroun \$35. The number of salaried workers in 1963 was estimated to be around 85,039 of which 24,223 worked in public activities and 60,816 were privately employed. About 19,000 were engaged in agriculture and cattle raising, 14,957 in commerce and transportation, 5411 in industry, and 4515 in forestry and fishing.

The economy of Cameroun is based predominantly on agriculture and produce derived from this activity is not only sufficient for the diet of the domestic population but also accounts for a large percentage of the exports. A variety of crops are cultivated in Cameroun, and those produced mainly for export are: cocoa, coffee, bananas, cotton, palm oil, peanuts and rubber. Although some tobacco is exported, most of it is processed by the cigarette factory in Yaoundé. Tea and rice are also cultivated. The principal food crops are millet and sorghum,

manioc, sweet potatoes and yams, corn, rice, bananas, taros and macabos, beans and sugar cane. Peanuts, which are grown throughout the country, are the main source of fats and oil in the local diet.

Raising of livestock is an important economic activity. The number of cattle is estimated to be around 1.8 million of which 750,000 head are in the northern part of the country, 750,000 in the Adamawa highlands, 250,000 in the Bamenda district, and 50,000 in the west. The number of sheep and goats is estimated to be about 1.6 million. Other livestock includes pigs, donkeys, poultry and a small number of horses in the north. Although some beef from the Adamawa highlands is exported to West African countries, most of it is sent to Douala and Yaoundé for local consumption.

Although more than half of Cameroun is covered by forests, wooded savannahs and mangroves, vast areas of forest land still remain untouched. Forestry has not been extensively developed as an industry, mainly due to lack of adequate transportation. The completion of the Transcameroun Railway should help to stimulate this industry. Most of the wood which is exported is in the form of logs.

Mineral production is concerned mostly with cassiterite and gold. Reserves of bauxite exist but again exploitation is dependent on the completion of the railway. Iron ore has been discovered near Kribi. Prospection for diamonds in the Adamawa highlands and copper in the region of Tiffel have not produced positive results. Traces of uranium have been found in northern Cameroun. To date the search for petroleum has been unsuccessful, but a few natural gas fields have been discovered near Douala.

Fishing is an industry which has not been fully developed. New fishing facilities are being built at Douala.

Numerous waterfalls in the country offer a great potential for the development of hydroelectric power but up to the present only the Edea Falls in East Cameroun have been utilized. Most of the cities depend on diesel thermal power plants. In West Cameroun, electric power is provided by a centrally-generated electric system and three small hydroelectric plants.

Cameroun has four seaports, Kribi and Douala in East Cameroun and Tiko and Bota (Victoria) in West Cameroun. The largest and most important port is in Douala. Four of the eleven berths for ocean vessels are being modernized with aid through FED.

East Cameroun has two main railways which run from Douala to Nkongsema and from Douala to Yaoundé. Other than a small rail line servicing the plantations, West Cameroun had no railroads. However, work began in March 1964, with aid from FED and FAC, on an extension which will connect with a branch of the Douala-Nkongsema line and run to Kumba in West Cameroun. A decision was made to build the Transcameroun Railway to join the underdeveloped north with the south. The existing line Douala to Yaoundé will be extended from Yaoundé to Ngaoundéré. Construction of the first section from Yaoundé to Belabo began in October 1964 with aid from FED, FAC and the United States (AID). Completion is expected by 1967. Ultimately, it is hoped to continue this line into neighboring countries to link them with the seaport of Douala by extending it possibly to Fort Archambault in Chad and constructing a spur from Belabo to Bangui in the Central African Republic.

Next to Senegal and the Ivory Coast, Cameroun is the most industrialized of the countries reviewed in this survey. Between 1960 and 1965, 35 new enterprises were created. The largest industrial enterprise is the aluminum plant at Edea, although all the raw materials used, including the ore, are imported and the finished products are all exported. Other industries include 3 slaughterhouses and refrigerated meat packing plants; 5 rice mills; factories for the processing of cocoa and tea; 9 palm oil, 2 cottonseed oil and 3 peanut oil mills; 4 cotton gins; 4 breweries; a carbonated beverages plant; an ice plant; a chocolate factory; bakery and food pastes establishments; 2 fish canneries; 7 soap factories; a perfume factory; an industrial gas plant; a cigarette factory at Yaoundé; a match factory; 5 latex factories; 40 sawmills; and factories for the manufacture of awnings, blinds, garments, shoes, aluminum utensils, bicycles, furniture, barges and small boats, and construction materials. A plant in Eseka makes prefabricated houses, most of which are sold in the neighboring countries. Some factories planned concern flour, sugar, cocoa butter, meat packing, textiles, cement and assembly of radio sets.

The value of exports in 1964 was estimated to be around \$136 million; of which \$122 million was credited to East Cameroun. In order of value, coffee, cocoa, aluminum, wood and cotton represent more than 85 per cent of the total exports of East Cameroun. The principal market is France. In West Cameroun preferential tariffs with the Commonwealth have been maintained on wood and tea and 65 per cent of the exchanges are with the sterling zone. Imports for 1964 were estimated to be around \$160 million with the principal supplier France. Main imports are vehicles, alumina, machinery and petroleum products.

NATIONAL BUDGET

In a speech to the budgetary session of the National Assembly in April 1965, the President of the Federation indicated that the budget would be balanced from Camerounian resources and foreign aid would in the future be reserved for capital development projects. The 1965-1966 estimated budget for the Federal Republic of Cameroun totalled \$92.7 million of which \$80.7 million was allocated for operating expenses. Health services account for 11 per cent, or \$8.8 million, of the operating budget. Based on an estimated population of 5 million, the average per capita for health services is \$1.75. The individual budgets for East and West Cameroun for this period were not available. However, the 1964-1965 budgets for the Federal Republic and the Federated States totalled nearly \$110 million. The first Federal budget appeared in 1962-1963 following the creation of the Federal Republic and the implementation of the new constitution. Since that time, health allocations no longer appear in the separate State budgets.

The following tables give data on the Federal and State budgets.

Federal Budget
(in thousands)

<u>Year</u>	<u>Total Budget</u>	<u>Central Government Operating Budget</u>	<u>Health Budget</u>	<u>Per cent of Operating Budget</u>	<u>Health Costs per capita*</u>
1962-63	\$69,635	\$64,092	\$7,001	10.9	\$1.60
1963-64	70,219	66,167	7,343	11	1.70
1964-65	80,470	75,162	8,002	10.6	1.60
1965-66	92,686	80,652	8,817	10.9	1.75

* Based on an estimated population of 4.3 million in 1962-63 and 1963-64; 5 million in 1964-65 and 1965-66.

Federal and State Operating Budgets
(in thousands)

	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65</u>
Federal budget	\$ -	\$64,092	\$66,167	\$75,162
East Cameroun	64,810	25,296	27,164	29,121
West Cameroun	8,477	6,900	8,006	8,910
Less Federal subvention to States	-	5,867	9,988	10,478
Total operating budgets	\$73,287	\$90,421	\$91,349	\$102,715
Total budgets*	\$85,975	\$98,945	\$98,659	\$109,997

* Includes equipment budgets.

ASSISTANCE PROGRAMS

Bilateral. French investment in the health activities of Cameroun through the FAC from 1959 to February 25, 1964 amounted to \$2.7 million, or about 8 per cent, of the total FAC investments in Cameroun during that period. These commitments relate to the La Quintinie Hospital at Douala (\$467,000); regional hospitals (\$284,000); rural medical equipment (\$102,000); child care centers (\$325,000); medical equipment for the Bamiléké district (\$61,000); establishment of a general public health plan (\$41,000); purchase of antimalarial drugs (\$162,000); and for the campaign against the endemic diseases (\$1,238,000).

United States assistance to Cameroun has been through the U.S. AID and the Peace Corps. In 1964, there were 88 Peace Corps volunteers in Cameroun. U.S. AID technical assistance projects relate to industry and mining, transportation, education, public administration, food and agriculture, health and sanitation and technical support. Under health and sanitation, a program begun in 1963, to

improve existing urban water systems, is being continued through 1966 at a total estimated cost of \$70,000. (See Appendix 1, Volume I.) Assistance for FY 66 includes aid in financing a measles vaccination program for children in Cameroun.

Under a technical assistance agreement, Canadian experts and professors are being sent to Cameroun and in 1965, 21 Canadians were teaching in East Cameroun secondary schools.

In late 1964, China (Taiwan) sent experts for a period of two years to instruct agricultural workers in modern farm techniques. Technical cooperation in the domain of fishing is also extended.

In 1964-1965, Great Britain provided 85 scholarships, mainly to West Camerounians, for study in Great Britain in the fields of medicine, law, radio, commerce, general administration, industry, etc. The number of scholarships was raised to 100 for the 1965-1966 term.

An aid agreement was signed in 1965 with The Netherlands on the establishment of a technical school in Dschang (West Cameroun).

West Germany gives financial and technical assistance to Cameroun. Her program includes a German-French textile factory, equipment for the national printing office, establishment of a commercial school at Tiko and of an agricultural training center at Wum, personnel and equipment for the school of nursing at Bamenda (construction to be financed through FED), a long-term loan of \$6 million to finance road building in Northern Cameroun, and a credit of \$2.4 million to finance projects of investment in the agricultural sector, a brickyard and a factory for canning meat. West Germany also provides scholarships to Camerounians.

Switzerland aided financially in the creation of a secondary boarding school at Douala for boys and girls. The French participated equally in the construction. Switzerland also assisted in the establishment of a school at Edea for home economics and a center at Betamba for training professional educators in dealing with juvenile delinquents. A Swiss religious order provided a school for training 30 African nurses a year in a rural area.

The USSR established diplomatic relations with the Federation in 1964 and made technical, scientific and cultural agreements with Cameroun. Under the latter agreement, 15 students were sent to Moscow in the fall of 1965.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in Cameroun totalled \$44.5 million for 26 projects. Of this amount, health and sanitation projects amounted to \$2.4 million (see Table 3, Volume I). Other commitments involved transportation (roads, bridges, the Transcameroun Railway), schools, agriculture and improvement of livestock in Adamawa. Of the \$2.4 million, \$2.2 million represents the investment program for health infrastructure relating to 14 hospital pavilions, 8 surgical suites, 1 maternal and child health center, 21 dispensaries and 50 housing units. In addition, the EEC approved \$6 million on November 18, 1964 to finance, through the FED, 11 health centers in rural areas (6 villages in West Cameroun and 5 in the southern part of East Cameroun). The investments involved construction of 9 maternity delivery rooms, 8 X-ray-surgical suites, 9 maternity pavilions with 240 beds, 13 medico-surgical pavilions with 332 beds, 1 hospital pavilion for otorhinolaryngology with 20 beds, 2 isolation pavilions with 60 beds, 7 housing units for physicians, 1 nursing school at Bamenda, 1

central pharmacy at Victoria and extensions or improvements to existing buildings including the addition of 50 hospital beds.

Project costs of the United Nations Expanded Program of Technical Assistance for Cameroun in 1964 totalled \$502,093. Some of these projects included assistance from UNTA for housing, public administration and community, industrial and natural resources development (\$64,743); from ILO for manpower organization including vocational training, social security, labor conditions and small-scale industry (\$89,095); from FAO for rural institutions and services, land and water development and plant production (\$57,581); from UNESCO for education and teacher training (\$132,641); and from WHO for malaria pre-eradication, assistance to health services, medical and nursing education and nursing advisory services (\$109,154). Thirty-one experts were involved in these projects and 17 fellowships were awarded nationals.

WHO assistance programs for 1965-1967 (see Table 33) provide for the continuation of the malaria pre-eradication activities, assistance to health and nursing services, for environmental sanitation, to the medical school and for fellowships.

UNICEF has provided funds for projects relating to the development of health centers, maternal and child health and leprosy control (see Table 34).

ORGANIZATION OF HEALTH SERVICES

In 1965, the Ministry of Public Health and Population was transformed into the office of the Commissioner General of Public Health and Population under the former Director of Public Health. Cameroun is divided into 18 health sectors.

Important changes have been made in the organization of peripheral medical services. In 1963, a decree of the President of the Federal Republic modified the endemic diseases control service (Service des grandes endemies) by entrusting it with responsibilities for rural medical assistance. The decree had little impact as long as the directors of health of each département within the country retained their authority over the staff of the rural dispensaries. The new organization is coming in force in 1965 with the clarification of responsibilities for curative and preventive services and the transfer of treatment of lepers from mobile units to fixed dispensaries. All urban and rural dispensaries became health centers either primary (élémentaire) or developed. The latter have a few hospital and maternity beds. The primary health center can be transformed into a developed health center according to local requirements. When a developed health center is transformed into a hospital of arrondissement it becomes part of the hospital system. All health centers are under the Médecin Départemental of the preventive medicine service which is responsible for the administration and supply of drugs. Specialized dispensaries and MCH centers of each department are also under the direct supervision of the Médecin Départemental.

The departmental center of preventive medicine (CDMP), expected to be set up in each department of the country, is a new element replacing the system of the endemic disease control sectors. The CDMP receives technical instructions from the central services, organizes and controls preventive programs, centralizes results of surveys and statistical data of the department, insures complementary training of the persons in preventive medicine and public health and supervises health education. Specialized dispensaries (TB, VD, MCH), health centers, leprosaria and mobile health units are under the authority of the CDMP. The departmental

heads of preventive medicine are under the Deputy Director of health services in charge of preventive medicine. Except for transfer of sick from health centers and exchange of information and statistics, the preventive medicine system is quite independent of the curative medicine system. The latter consists of the hierarchy of hospitals of the arrondissement, département or region. As all curative work is done by a hospital physician, the name of arrondissement hospital indicates the presence of a full-time hospital physician. The new system will result in a considerable increase in the work load of the chief medical officer of the CIMP as compared with that of the former chief medical officer of the sector of endemic disease control. This situation will require reduction of the area of the sectors (24 sectors instead of 14 in East Cameroun) and the assistance of a chief zone nurse who will be in charge of a health center and of the treatment circuits. At present, the system is not fully staffed and provisionally there are three types of departmental services: (A) Department (100,000-130,000 inhabitants) with one hospital physician and a departmental chief medical officer (preventive medicine); (B) department (50,000-90,000 inhabitants) with a physician who is assisted in preventive services by a chief zone nurse; (C) large size departments or groups of departments functioning as a single unit. Types B and C are expected to disappear as soon as the number of new physicians are sufficient.

There are 183 physicians (of whom 134 are in government service, 19 in private practice and 30 in the missions); 28 pharmacists (6 in government, 21 in private and 1 in the missions); 13 dental surgeons (4 in government, 7 in private and 2 in the missions); 765 nurses (705 in government and 60 in the missions); 41 midwives (36 in government and 5 in the missions) and 450 assistant midwives. As of September 1, 1965, 67 physicians had been provided by the French Ministry of Co-operation. Based on an estimated population of 5 million, the doctor/population ratio is about 1:27,300.

Since there are no training facilities for doctors in the country, medical students are educated abroad, mostly in France. At the University of Dakar during the 1964-1965 term, 8 out of 46 students from Cameroun were studying medicine. In 1963, at the request of the Government, a WHO mission studied the possibility of establishing a faculty of medicine within the Federal University at Yaoundé, which would be open to students from the Equatorial States as well, and recommended establishing the faculty and a teaching hospital; the faculty is expected to open in October 1968 (see page 133). There are three nursing schools which award the State diploma: the state school at Ayou, the Catholic school at Yaoundé and a private one in Douala. Generally, fully qualified midwives studied in France, but consideration was given to expanding the nursing school to include a section for midwives. A section for social assistants is also being planned. FED is financing the construction of a nursing school at Bamenda and West Germany is providing the personnel and equipment.

In connection with the development of health centers, the Government is giving particular attention to training of professional and auxiliary personnel to provide preventive and curative services, including special maternal and child health care, public health education, nutrition, control of communicable diseases and social welfare. Training activities include the provision of fellowships for medical students to study abroad, reorganization of nursing schools, and the creation of a school of public health to train personnel in the field of preventive medicine. The Government is also continuing its efforts to train other public health personnel, such as laboratory technicians, medical nurses and sanitation agents.

An advanced training center for medical and paramedical personnel in a rural area near Yaoundé is planned with aid from the International Children's Center in Paris. UNICEF will assist with scholarships, equipment and materials.

An Ordinance of February 1960 provided for the establishment of (1) a National Association of Physicians which includes all physicians entitled to practice in Cameroun, (2) a National Association of Dentists, and (3) a National Association of Midwives. There is also a Syndicate of Pharmacists.

The medical organization, established by France, was essentially a network of hospitals, medical centers and dispensaries. Facilities include 4 general hospitals (2 at Douala and 1 at Yaoundé and 1 at Ayos); 19 secondary hospitals with surgical units (16 public and 13 private); 58 medical centers (44 public, 3 private and 11 missionary); 354 infirmaries and dispensaries (283 public and 71 missionary dispensaries); 7 maternity clinics not attached to hospitals (4 public and 3 missionary); 37 leprosarria (28 public and 9 missionary) and 25 school health units. In East Cameroun, there are approximately 10,868 hospital beds (6530 in the public health units and 4338 in the private units). In addition, the leprosarria have 4601 beds. In the public and private sectors, the ratio is 1 bed for every 460 persons.

PUBLIC HEALTH PROBLEMS

Sleeping sickness was epidemic on a vast scale in the early 1920's, when the first field survey revealed 105,902 cases in the first 355,000 persons examined. Only 83 cases were found among 1.45 million persons examined in 1964. Low grade endemicity persists in the Yaoundé area, and more serious endemicity in the region of the Chad frontier. There, in 1961, the two countries combined to carry out a project for the eradication of tsetse along the Logone River, by dieldrin spraying. Though not completely successful, the project has had good results. Malaria has been found to be holoendemic up to 5000 feet altitude and transmitted freely even above 5000 feet. Two pilot malaria eradication projects have been carried out. In a northern savannah area, four years' conscientious spraying with DDT achieved only a modest decrease in the intensity of transmission. In a forest area, near Yaoundé, transmission was actually interrupted while spraying was in progress, but it recommenced as soon as spraying stopped. At present, the control measures appear to be confined to chemoprophylaxis among school children. The whole of the school population in North Cameroun (300,000 students) received nivaquine in 1965, thanks to a gift of 45 million tablets from France.

Onchocerciasis occurs in many foci, the worst of which is in the Mayo Kebbi area, in relation with the Nigerian frontier and the upper reaches of the Benue River. In this focus, during the 1950's, an ambitious Simulium control project was carried out, but it is believed that the fly has had little difficulty in re-establishing itself since operations came to an end. Schistosoma haematobium infection is common in northern Cameroun, especially near Lake Chad, decreasing southwards and is rare south of the Benoué département. S. mansoni is found in many areas throughout the country. An important focus of intestinal schistosomiasis with about 900 cases (1958-1963) has been brought about near Yaoundé by the creation of fish ponds.

Following an outbreak of smallpox in 1961 with 1500 cases and 207 deaths, vaccination campaigns were launched. In 1962, 1.5 million vaccinations were given. In 1964, the number of cases and deaths decreased to 81 and 2 respectively.

In the past, leprosy control activities were restricted to areas within reach of the main leprosy institutions but expansion into more accessible regions has been made possible with vehicles supplied by UNICEF. Mobile as well as bicycle circuits are now operating. The campaign has also been expanded to include West Cameroun. By the end of December 1964, 44,000 cases were registered of which 30,000 were under treatment. WHO has provided advice and guidance and UNICEF has supplied drugs, transport and equipment.

Yaws is still an important problem in Cameroun. The disease is rarely seen outside the forest area where its incidence is increasing among the Babinga (pig-mies) communities which appear to form a permanent reservoir of the disease. In 1964, the number of cases of yaws in Cameroun was estimated at more than 100,000. Cases seen and treated in East Cameroun numbered about 14,500 in 1963 and 11,700 in 1964. The number of cases of venereal syphilis recognized in Cameroun does not vary from year to year: about 7000 per year (1960-1964). The incidence is high in the towns, especially in the northern part of the country. There were 3000 infected persons among 35,000 inhabitants of Maroua (Diamaré department).

Tuberculosis is considered by some French observers as being the second most important health problem of Cameroun outranked only by malaria. In the absence of statistical data, it is of interest to note that the average rate of ambulatory cases reporting for treatment was 27.9 per 100,000 (1960-1964). Some data on tuberculin sensitivity among children have been collected but further surveys are needed.

The work of the (British) Helminthiasis Research Unit at Kumba is concerned with filariasis, mainly onchocerciasis and loiasis. The Pasteur Institute at Yaoundé has suffered from a shortage of research staff, and at times has been able to do little more than maintain production of vaccines and routine laboratory examinations. The latter, when they are looked for, have revealed the prevalence of diseases, such as typhoid fever and sporadic typhus. In hospital admissions at Yaoundé, approximately 100 cases of typhoid are diagnosed annually, and a three-months' investigation of rickettsioses revealed 50 cases—30 per cent of the medical admissions for the period.

Table 33

Estimated WHO Commitments in Cameroun, 1965-1967

<u>Project</u>	Number of Posts			Estimated Obligations		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	5	5	5	\$ 74,492	\$ 79,987	\$ 85,813
Assistance to health services	2	2	2	18,094	34,793	30,940
Nursing advisory services	2	2	2	21,563	28,331	29,950
Environmental sanitation	-	1	1	-	17,921	36,234
Medical School at Yaoundé	-	-	1	14,400	17,000	16,788
Fellowships	-	-	-	<u>65,600</u>	<u>103,600</u>	<u>44,000</u>
Total	<u>9</u>	<u>10</u>	<u>11</u>	<u>\$194,149</u>	<u>\$281,632</u>	<u>\$243,725</u>
Other obligations				\$ 63,000	\$ 75,000	\$ 40,000
Total estimated Government Contribution					355,100	355,100

MALARIA PRE-ERADICATION PROGRAM (1962-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Cameroun can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

The first addendum to the plan of operation, signed in October 1964, made provision in a detailed plan for the activities of the next two years; the malaria service has been reorganized in order to utilize to the best advantage existing personnel, including staff formerly involved in the spraying operations which were discontinued in March 1964. Special retraining courses were given to these personnel before reassignment to other activities in the service.

Passive detection of cases continued in the previously sprayed areas and on this occasion suspected malaria cases received treatment. Anti-malaria drugs have been made available to the population and especially to school children in the former Yaounde pilot project area.

A preliminary survey was carried out during October/December 1964 among school children in North Cameroun where the Government, with the assistance of bilateral

aid, intended to undertake a chemoprophylactic campaign twice a year. A second survey at the end of the scholastic year will establish the advantages gained from chemoprophylaxis in school children.

The Djoum area, which according to the plan of action should have served as a pilot project to ascertain the efficiency of reduced DDT dosages, after a preliminary survey was found unsuitable for such a trial.

Emergency spraying operations were carried out in several localities (Bafia Eseka and Kribi) where severe outbreaks of malaria occurred.

The laboratory examined 85,128 slides of which 30,068 proved to be positive (35.2 per cent).

Extensive training of the personnel of the National Malaria Service was carried out during the year. Special courses on malaria microscopy were organized for laboratory technicians already in service at health centers and private institutions. So far a group of 12 such technicians has been retrained. This constitutes a first nucleus of personnel to be employed for the examination of blood films of fever cases in peripheral health institutions.

During the year the public health adviser has endeavored to complete an inventory of existing facilities in Cameroun in regard to health establishments and professional and auxiliary personnel. The demonstration and operational research zone of Nyong and Sanaga and Nyong and Kélé have been actively studied and a draft plan of action submitted to the Government in order to find the best possible way to integrate health activities in this zone.

ASSISTANCE TO HEALTH SERVICES (1961-1967). To assist in reorganization and strengthening of health services in West Cameroun.

Two medical officers were assigned at Wum and at Kumba. They have given particular attention to the general public health problems (hospital administration, environmental health, medical care and preventive medicine) and to communicable diseases.

During the year under review the medical officers submitted recommendations to the Government, especially in connection with training of paramedical personnel.

Relations between this project and the work accomplished by the WHO public health adviser of the malaria project will be clearly defined at the time of planning.

At Government request the project will continue in 1965 with WHO regular funds in the hope that the operational funds of the EPTA program can allow assistance to continue.

NURSING ADVISORY SERVICES (1962-1968).* To assist in developing programs for the education of midwifery and nursing personnel and in the strengthening of nursing services.

The plan of operations for this project has been revised in the light of comments submitted by the Government.

* This project receives UNICEF assistance.

The nurse educator is working closely with the Chief Nurse at the Ministry of Health on the development of a program for basic nurse education, which will be applied to the whole country. Work also is going ahead on the organization of a demonstration area where students can gain practical experience in public health nursing.

Assistance has been given in the planning and carrying out of two refresher courses for midwives in West Cameroun, and a refresher course for existing nurse personnel in Yaoundé.

ENVIRONMENTAL SANITATION (1966-1968). To assist in setting up a sanitary engineering unit, in formulating a sanitation program and in training personnel.

ASSISTANCE TO MEDICAL SCHOOL AT YAOUNDE (1966-). To provide advisory services on setting up a medical school and a teaching center at Yaoundé.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular and the technical assistance budgets was allocated by MESA for the years 1965 to 1967 successively \$18,000, \$11,000 and \$11,000.

Table 34

UNICEF-Aided Projects in Cameroun, 1960-1964

Total allocation: \$237,000

	Approved 1961
BASIC HEALTH - MATERNAL AND CHILD HEALTH (MCH)	\$ 69,500

Training activities in connection with the development of health centers and MCH demonstration centers include provision of fellowships for medical students to study abroad, reorganization of nursing schools, and the creation of a school to train auxiliary personnel. UNICEF has provided training materials, equipment, drugs, vehicles, stipends for trainees. WHO is providing technical guidance and fellowships for professional personnel.

UNICEF will provide (1965-66) equipment and basic materials, vehicles and local scholarships for 60 students in connection with the reorganization of 12 prefecture and sub-prefecture health centers and the establishment at Okola (25 miles from Yaoundé) of a rural advanced training center for medical and paramedical personnel. The center will be set up with the assistance of the International Children's Center in Paris.

	Approved 1960-64
LEPROSY CONTROL	\$ 148,100

UNICEF has provided sulfone drugs and transport for the campaign, as well as equipment for a transport maintenance organization. WHO has provided advice and guidance.



CAMEROUN



REPUBLIC OF TOGO

Population:	1,620,000	Number of doctors:	60
Area:	21,850 sq. mi.	Doctors per population:	1:27,000
Capital:	Lomé	Hospital beds:	3800 or 1:425

GENERAL

Geography and topography. Situated on the Gulf of Guinea, the Republic of Togo is wedged between Ghana on the west and Dahomey on the east. The country, with a total land area of approximately 21,850 square miles, is a narrow corridor, extending almost due north from the Gulf, about 350 miles in length and no more than 100 miles in width. The coastal area is around 30 miles wide. North of this is a plateau and a small mountain chain (Atakora Mountains) with an average elevation of 2000 feet, crossing Togo from Ghana in a southern-northeasterly direction and extending into Dahomey.

Population. Census operations (November 1958 - December 1960) accounted for a population of 1,440,000; unofficial estimates, as of January 1965, indicate the population to be around 1,620,000, of which 2000 are non-Africans. Based on the 1965 estimate, the average density would be 74 persons per square mile.

In the more densely populated coastal region surrounding Lomé, the density exceeds 725 inhabitants per square mile and in the administrative area of Anécho about 775 persons. Population is also concentrated around the Lama-Kara and Dapango areas in the north. The central part of Togo is the least populated and a few small areas are almost totally uninhabited.

Lomé, the capital and economic and administrative center, has an estimated 121,000 inhabitants. Other urban centers are: Sokodé (16,200); Palimé (14,400); Tsévié (13,600); Anécho (12,100); Atakpamé (11,500); Bassari (10,100); Mango (7800); Tabligbo (5900); and Bafilo (5400).

The rural population is estimated to be roughly 1,350,000 and the urban population about 250,000, of which the average age is 20. Over 50 per cent of the total population is under 14 years of age.

Government. Part of a German protectorate before World War I, Togo became a League of Nations mandate and after World War II a United Nations Trust Territory under French administration. In October 1956, the people voted for an autonomous republic within the French Union and the termination of the Trusteeship. This proposal was accepted by the United Nations and the Trusteeship was abolished when independence was achieved on April 27, 1960. A year later, Sylvanus Olympio, the prime minister, was elected President of the Republic. In January 1963, he was assassinated by disgruntled ex-soldiers and Nicolas Grunitzky, who had been in exile in Dahomey, was invited to be the provisional president. Later he was elected to the office. A new constitution, adopted in May 1963, provided for a presidential form of government but with certain parliamentary features. The National Assembly is composed of 56 deputies elected for five years by universal suffrage.

Togo is divided into 4 regions corresponding to the geographical areas and

17 administrative districts called circonscriptions. Each region is headed by an inspector appointed by the President and each administrative district is headed by a chief also designated by the President. The six municipalities are: Lomé, Aného, Atakpamé, Palimé, Sokodé and Tsévié.

Togo is a member of the OAU and the OCAM, an associate member of the European Economic Community and a member of the United Nations and its specialized agencies. In 1963, Togo was admitted as the seventh member of the West African Monetary Union and was expected to formally join the Conseil de l'Entente in late 1965. The Government also maintains close relationships with France through special cooperative agreements.

Education. In 1965, the Government allotted \$2.4 million, or 12 per cent, of its operating budget for national education. The average rate of enrollment in 1964-1965 was about 55 per cent. In urban areas, the rate is somewhat higher. During this period, 160,000 children were enrolled in the primary grades nearly doubling the number since 1959. There were 12,000 students in the secondary and technical schools and about 600 in higher education studying outside of the country. With the exception of France, Dakar University receives the largest number of Togolese studying abroad (77 in 1964-1965).

Construction of a secondary school together with a National School of Administration in Lomé was financed through the FED (\$2.1 million) and inauguration of these buildings took place in December 1964.

ECONOMIC RESOURCES

American sources estimated the gross national product of Togo in 1963 to be between \$112 and \$118 million with a per capita income of \$75. French sources have given the per capita income in 1965 as \$80 and an estimated per capita of \$90 by 1970.

The first Five-Year Plan (1966-1970), adopted in July 1965 by the National Assembly, involves a total investment of \$115.9 million of which \$6.8 million is allocated for education and \$6.2 for health and social and cultural equipment. The remainder is for communications, transportation, agriculture, commerce, industry and urban and rural development.

The economy of Togo is predominantly agricultural with more than 90 per cent of the population engaged in family-type farming. Cultivation is devoted to producing food for domestic consumption and export to neighboring countries. However, some food products pass unofficially across the border and are therefore not recorded as exports. Food crops consist of yams, manioc, corn, millet and sorghum, rice, gourds, peppers, tomatoes, beans, onions and fruits. The most important crops produced for export are cocoa and coffee. Poor soil and lack of adequate water have been a hindrance to production. Potential arable land covers some 7700 square miles but, at present, only a part of this productive land is being cultivated.

Livestock is raised throughout the country on a small scale, but cattle is more prevalent in the northern part of Togo. The number of cattle is estimated to be about 140,878 head; sheep and goats - 895,986; swine - 188,241; and poultry - 1,028,000.

In addition to the partially wooded savannah, about 10 per cent of the land area is covered with forests. Even with the government program to reforest the land, it has been necessary for Togo to import wood for domestic needs.

Fishing, although an important domestic activity, is accomplished on a very small scale. One handicap to this industry is the lack of an adequate fishing port.

Togo has few known mineral resources. The only one of importance is a phosphate deposit behind Lake Togo which is being exploited by a company owned jointly by the Togo government (20 per cent) and by six French enterprises (80 per cent). Shipments, which began in 1961, are an important source of government revenue. Phosphate represented 26 per cent of the total value of exports in 1964. Small deposits of chromite, bauxite and iron have been discovered.

Industrial enterprises consist essentially of a few small processing plants for agricultural products and several industrial factories. These include a plant for the production of starch, cotton gins, an ice plant, factories for processing palm oil, soft drinks, soap and coffee, a sawmill, production of concrete products, a printing office and a workshop for recapping tires.

Plans have been made to increase the capacity of starch production, to construct a textile factory (\$3.5 million) and a brewery (\$750,000) both with Togo government and West German private capital and German equipment, to establish a cement factory (\$800,000) and a flour-rice mill and to develop the fishing industry.

Artisans account for about 4 per cent of the working population, but the methods used are fairly primitive. Brickmaking, cabinetwork and carpentry are the most important crafts. About 1 per cent of the active population are salaried workers, most of whom are employed by the government.

At Lomé, Togo's gateway to the sea, the inadequate port facilities consisted of a simple wharf. Work on construction of a deep-water port began at the end of 1964 with the aid of a 30-year loan of \$13.2 million from West Germany for the first phase of this modernization program. The total cost of the work is estimated to be around \$31.6 million.

There are about 880 miles of all-weather roads of which about 80 miles are paved and 1880 miles of secondary roads used principally during the dry season. Railroads in Togo consist of three main lines (275 miles) each originating in Lomé and running north to Blitta, northwest to Palimé and along the coast to Anécho. Extensions are planned from Blitta to Bassari and Sokodé to link the south with the developed sections of the north and from Anécho to Grand Popo, just inside Dahomey, to provide a rail connection with the port of Cotonou.

The total electric power output in 1964 was 9,187,000 kwh. Power is produced by a large electric generating plant at Lomé and four smaller ones. Another diesel-powered plant is operated by the phosphate mining company near Lake Togo. A 1600-kw hydroelectric station near Palimé was built in 1963 with a five-year loan of \$1.5 million from Yugoslavia.

With the exception of the year 1959, Togo has had an unfavorable balance

of trade since 1956. Exports in 1964 were valued at \$30.2 million with coffee (34 per cent of the value), phosphates (26 per cent) and cocoa (22 per cent) as the principal items. Other products exported included palm products, starch, peanuts, cotton, copra and oil. For the same year, imports were valued at \$41.7 million. Main imports included food products, beverages, machinery, vehicles, tobacco and petroleum products.

Although France is the principal client and supplier, the value of exports to that country has been decreasing since 1959. In 1964, France received 44.1 per cent of the total value of exports from Togo and supplied 28.2 per cent of the imports. In 1964, the United States ranked as the second client and received 10 per cent of the exports and supplied about 3 per cent of the imports.

NATIONAL BUDGET

In 1965, Togo's estimated operating budget totalled \$20.2 million of which \$1.9 million, or 9 per cent, accounted for health services. Based on an estimated population figure of 1.6 million, the average per capita for health services was \$1.15. The following table gives budget data for the last five years (in thousands):

Year	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health costs Per Capita*
1961	\$13,480	\$ -	-	\$ -
1962	14,400	1,395	10	.97
1963	14,720	1,475	10	.95
1964	23,545	1,700	7	1.05
1965	20,155	1,850	9	1.15

* Based on estimated population figure of 1.44 million in 1962; on 1.58 million in 1963 and 1964; and on 1.62 million in 1965.

The 1966 budget presented to the National Assembly amounts to \$22.4 million of which 10 per cent is for capital investment.

ASSISTANCE PROGRAMS

Bilateral. French investment in the health activities of Togo through the FAC from 1959 to February 25, 1964 amounted to \$265,000 for rural medical equipment. Total FAC credits from 1959 through 1964 were about \$11 million.

The U.S. AID technical cooperation and development grant program in Togo involved \$756,000 (of which \$295,000 was allocated for health and sanitation) in FY 63; \$497,000 (\$35,000 for health and sanitation) in FY 64; and \$411,000 (\$25,000 for health and sanitation) for FY 65. From FY 63 to FY 65, this Agency provided drugs and equipment to support Peace Corps activities at a total estimated expenditure of \$275,000.

Under the economic and technical cooperation agreements, West Germany has

provided consulting services for expansion of industry, agriculture and transportation and aided in the formation of a State School for Midwives and a National School of Nursing. Experts were loaned for the study of salt production by extracting salt from sea water and on the provision of potable water at Sokodé. A 30-year loan of \$13.2 million was granted for the first phase of a program to improve the port facilities at Lomé where work began in late 1964. West Germany's assistance to Togo in the field of public health was based on a survey of the country's health problems and requirements.* In March 1965, an agreement was signed for construction of an Institute of Hygiene (\$980,000) whereby Germany will staff the Institute for four years and train replacement personnel. West Germany also provides scholarships for Togolese students.

Israel advised on housing development and provided experts to organize the young farm pioneers. Switzerland has contributed through a religious order by constructing and equipping a secondary college at Lama-Kara to provide for 300 students, including a boarding school with 160 beds, housing for the teaching staff and a dispensary.

Under a cultural agreement in 1964, the United Arab Republic will assist with the exchange of professors and students, books and films and scholarship grants.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in Togo totalled \$14 million for 18 projects. Of this amount, \$2.6 million was invested in health and sanitation projects (see Table 3). Other commitments during this period involved transportation and schools. Assistance to the health infrastructure, amounting to \$1.1 million of the \$2.6 million, included construction of a maternity clinic at Anécho (\$30,000), construction of a maternity clinic and a hospital pavilion at Palimé (\$90,000) and for the nursing school (75 students) and maternity clinic at Lomé (\$968,000). The three maternity clinics include 206 beds and the hospital pavilion 36 beds. A sewage disposal network, covering about one-fifth of the Lomé area, has been completed but is not yet in use except for rain water overflow. So far, only about 15,000, or one-eighth, of the inhabitants have piped water.

Under the United Nations Expanded Program of Technical Assistance, project costs in 1964 totalled \$424,473. These projects included UNTA assistance in economic surveys, public finance and administration and social development and services, \$73,355; ILO assistance for manpower organization, cooperation and small-scale industry, social security and labor administration, \$32,396; from FAO for plant, forestry and fisheries development and nutrition \$93,950; UNESCO for mass communication and educational planning, \$64,666; and WHO for malaria pre-eradication, public health administration, health and medical education and vital health statistics, \$130,082. There were 25 experts and technicians connected with these projects and 31 fellowships were awarded to nationals.

WHO assistance programs during 1965-1967 (see Table 35) relate to the continuation of the malaria pre-eradication activities, treponematoses control, epidemiology services, public health laboratory, hospital administration, nursing advisory services, health education, maternal and child health, environmental sanitation and fellowships.

* Seeliger, H.P.R.: Hygiene-Probleme in Togo. Arch. Hyg. Bakt., 147 (4/5), Aug. 1963, pp. 307-348.

UNICEF provided funds for projects relating to maternal and child health, environmental sanitation, yaws control and social welfare and community services (see Table 36).

ORGANIZATION OF HEALTH SERVICES

The health activities in Togo are under the Ministry of Public Health. The head of the technical services is the Director of Public Health, directly responsible to the Minister of Public Health. Under the Director is an Assistant Director and the heads of the four bureaus of the Directorate: (1) studies and planning, (2) administration and personnel, (3) public health and social hygiene, and (4) pharmacies. Heads of bureaus (1) and (3) are physicians. An advisory medical committee and an administrative committee for hospitals, created in 1958, control the activities of all hospitals and outpatient clinics insuring better diagnosis and treatment of communicable diseases and also the participation of local authorities in the administration of hospitals.

The Public Health and Social Hygiene Bureau includes the service of endemic diseases and its mobile teams and is responsible for preventive medicine activities and also the rural health demonstration zone at Vogon (about 15 miles from Anécho).

The demonstration zone for basic health services at Vogon (called ZODEROSAP) proved most valuable in providing field training for supervisory staff and practical training or retraining of auxiliary staff. It is an excellent example of integrated rural health services. The success of this zone and the experience acquired there will provide polyvalent preventive and curative services to an area, with 200,000 to 250,000 inhabitants, where the malaria pre-eradication program is now in progress.

The country is divided into 15 health sectors corresponding, as a rule, to the administrative circonscriptions. Each health sector is headed by a medical officer.

In 1962, medical facilities included 2 public general hospitals (at Lomé - 600 beds and at Sokodé - 212 beds); 14 general secondary public hospitals (at Anécho, Tabligbo, Tsévié, Klouto, Nuatja, Atakpamé, Palimé, Lama-Kara, Bassari, Pagouda, Mango, Kandé and Dapango) with 1325 beds; 2 polyclinics; 17 maternity clinics; 145 rural dispensaries and 6 private dispensaries; 2 leprosaria; 3 trypanosomiasis treatment centers and 1 pharmacy supply. In addition, there are 7 mobile teams. There are about 3800 hospital beds or 1 for every 425 persons. A new hospital with 80 rooms was opened in 1964 in Afagnan, about 40 miles from Lomé. It is the second largest hospital in Togo and is managed by eight Brothers of a French religious order, two of whom are doctors. Facilities consist of two operating theaters and departments of obstetrics and pediatrics.

There were 60 physicians (21 foreigners and 29 nationals in government service and 10 private doctors); 5 dentists; 16 pharmacists (12 of whom are private); about 350 nurses; 83 midwives and 104 auxiliary midwives; and 68 hygiene and technical assistants. As of September 1, 1965, 4 physicians were detailed to Togo by the French Ministry of Cooperation. Seven German physicians were provided in 1961 for the hospital center at Lomé and, in 1965, their tour of duty was extended for two additional years. The doctor/population ratio averages about 1:27,000.

Professional medical personnel are trained in Europe or in Dakar. A scholarship system enables qualified African students to complete their studies in France. In 1963-1964, there were five students enrolled in the Dakar Faculty of Medicine and Pharmacy. Nurses and midwives are generally trained at the school in Lomé or at the nursing schools in Ayos, Cameroun, or Brazzaville, Congo, where courses lead to the French state nursing diplomas. The nursing school at Lomé graduated 20 nurses in 1963 and 26 in 1964; and in 1965, 90 students were enrolled. The Ministry of Health created in 1964 a State School for Midwives at Lomé patterned after the Dakar school and the nursing school became a National School for Nurses.

With the assistance of the Togo Government, WHO set up the Malaria Eradication Training Center at Lomé which provides courses for professional and auxiliary personnel for French-speaking students of Africa. Three courses are planned annually with provision for 20 trainees at each course. The first course for health assistants and technicians, lasting 11 weeks, started February 1964. WHO provides all the equipment, supplies, transport, local operating costs and fellowships for students while the Government provided an instructional block and insectarium and assisted with student housing. The Center has an international staff. WHO also helped in the development of a training program for sanitation personnel with the ultimate objective of setting up a sanitary engineering section within the Ministry of Public Health. The first group of students at the Ecole d'Assistants d'Hygiene at Lomé began their studies in December 1963. Registered for the second course in 1964-1965 were six first-year and seven second-year students.

Togo became a member of the OCCGE in October 1964. Its endemic diseases service is run by officers of the French Marine Corps, but they are few in number as compared with those of other member countries of OCCGE.

PUBLIC HEALTH PROBLEMS

In 1962, the Ministry of Public Health considered malaria to be the number one public health problem in Togo. With assistance from WHO, a pre-eradication program was planned for the entire country. Early surveys indicated overall parasite rates of 73.8 per cent in the north (on 15,855 examinations) and 52 per cent in the south (on 2415 examinations). Plasmodium falciparum was the predominant parasite species in both regions. Anopheles gambiae and A. funestus were found to be the two main vectors. It was recommended that the first phase of operations begin in the more populous southern region in 1965, in the central region in 1967 and in the north in 1969. The preliminary malarimetric survey, completed in November 1964, showed that malaria was hyperendemic except for certain forest areas where it is holoendemic and the Palimé plateau where it is mesoendemic (see Table 35). WHO has undertaken the training of personnel to form a nucleus of a national malaria service at the Malaria Eradication Training Center and the rural demonstration zone.

Sleeping sickness occurs only in the northern (savannah) zone. There is an old epidemic focus in the region of Bassari. This is continuous with a focus in the Yendi district of Ghana. There is no liaison between the health authorities of the two countries, and a serious frontier problem is involved. The number of new cases diagnosed annually in Togo averages about 70, but the efficiency of survey work is open to suspicion. The Bassari-Yendi focus is one of the danger points in West Africa,

Yaws is endemic in both southern and northern Togo. In the north, the Bassari-Yendi area has provided the only focus in the whole West African savannah that has resisted the effects of mass penicillin. The presumed reasons are the frontier problem and the primitive way of life of the Konkomba tribe. WHO and UNICEF assisted in a campaign against yaws which was later extended to include leprosy and smallpox. Seven mobile teams are operating over the whole of Togo. As of mid-1964, results of the campaign indicated a 2.2 per cent incidence of infectious yaws in the coastal region and 0.15 per cent in the rest of the country. During this period, of 407,407 persons registered, 358,069 were examined and 5711 cases of yaws were identified. A large percentage of the cases were found in children. Resurveys are being continued. The incidence of leprosy was found to be low in the coastal area but the rate increases further north. The endemic level is highest in the Pays Cabrai (Pagouda—central region). Nearly all of the people examined during the campaign were vaccinated for smallpox. The percentage of takes varied between 80 and 85 per cent.

Onchocerciasis is endemic along the Oti and Mono Rivers in the north and is suspected of spreading southwards along the Mono. Its distribution is currently under investigation. The north of Togo is in the meningitis belt, but serious epidemics of cerebrospinal meningitis have been comparatively rare. The last great epidemic occurred in 1948.

Malaria pre-eradication activities and the control of other endemic diseases are Togo's priority tasks; the development of rural water supplies and health education of the population (in nutrition, child care, sanitation) are believed to be the country's next most important health problems.

* * * *

With its demonstration zone for basic health services (at Vogan), environmental sanitation pilot zone (at Nuatja) and the extension of integrated rural health services to the area now under the malaria pre-eradication program and the Ecole d'Assistants d'Hygiene, Togo offers possibilities for practical training which should be of greater interest to other French-speaking countries of Africa.

Table 35

Estimated WHO Commitments in Togo, 1965-1967

<u>Project</u>	<u>Number of Posts</u>			<u>Estimated Obligations</u>		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	6	5	5	\$ 98,164	\$136,733	\$106,346
Treponematoses control	2	-	-	30,810	-	-
Fellowships (leprosy)	-	-	-	3,250	-	-
Public health laboratory	-	2	-	-	24,100	12,000
Hospital administration	-	-	-	8,500	-	-
Epidemiological services	1	1	1	11,966	16,422	18,454
Fellowships (Public health administration)	-	-	-	3,700	-	-
Vital and health statistics	1	-	-	4,500	-	-
Fellowships (vital and health statistics)	-	-	-	-	-	12,000
Nursing advisory services	1	1	1	19,724	20,346	21,610
Health education	1	1	-	15,782	17,438	-
Maternal and child health	-	-	-	4,800	-	-
Environmental sanitation program	2	2	2	34,393	40,928	43,903
Fellowships	-	-	-	<u>12,000</u>	<u>16,000</u>	<u>20,000</u>
Total	<u>14</u>	<u>12</u>	<u>9</u>	<u>\$247,589</u>	<u>\$271,967</u>	<u>\$234,313</u>
Other obligations				\$ 93,000	\$ 79,000	\$103,000
Total estimated Government Contribution				205,000		

MALARIA PRE-ERADICATION PROGRAM (1962-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Togo can be built; to train personnel to form the nucleus of a national malaria service; to undertake

a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

The first addendum to the plan of operation, containing a detailed plan of action covering the project malaria activities signed in October 1964, made provisions for collection of epidemiological base line data throughout the country and implementation of residual spraying activities in the demonstration area. The preliminary malarionetric survey was completed in November 1964. This has shown that malaria in Togo is hyperendemic except for some limited forest areas where malaria is holoendemic, and the Palimé plateau (Plateau Daye) characterized by mesoendemicity. Concurrently, a study on the distribution of P. ovale in the country showed a uniform prevalence of this parasite species irrespective of variations in ecological conditions and a distinct prevalence in the specific age group five to nine years.

Collection of epidemiological base line data covering a full year's observation in seven indicator districts (representing the main ecologies of the first region) was completed in December 1964. Further investigations were carried out as from January 1965 in the demonstration area. The presence of A. melas was demonstrated in localities bordering Lake Togo (Kwenou) and its vectorial implications are under study with the collaboration of the Malaria Eradication Training Centre entomological staff.

Training of the national malaria service personnel continued during the year. Special courses in health education were given to the supervisory field staff (sector and squad chiefs). Personnel from other health services also attended these courses. Special training courses were devised for the first nucleus of auxiliary itinerant health workers for the basic health services and reorientation and retraining courses were given to all health personnel deployed in the demonstration zone.

The training courses in malaria microscopy for general laboratory technicians already assigned to peripheral health centers were continued. At present all the laboratories, government and private, in the demonstration area and in the first region are staffed with personnel capable of making a correct microscopical diagnosis of malaria. Blood films are received regularly at the central laboratory of the national malaria service for cross-checking of results obtained by the peripheral laboratories.

Maps, itineraries and equipment were made ready for the first round of residual spraying which started on 15 March 1965, in the demonstration area of Vogan.

A sufficient quantity of anti-malaria drugs has been made available through the national malaria service for the population living in the demonstration area and in the districts where laboratory diagnostic facilities have been improved.

The inventory, planning for the development of peripheral health networks and the operational research and demonstration zone, have been terminated. The plan of action covering the development of health services has led the Government to submit a plan of operations to WHO and UNICEF with a view to obtaining their assistance in connection with an integrated health service.

A first coordination meeting for the pre-eradication programs of Dahomey, Ghana, and Togo, held in Lomé in November 1964 has shown the necessity of close coordination between neighboring countries and the possibility of good cooperation in operational research in the demonstration areas.

It was decided to convene the senior staff of the three projects at four-monthly intervals in each country in turn to study the progress accomplished and the means to further better coordination. The second of such meetings was held in Cotonou in March 1965.

TREPONEMATOSSES CONTROL (1962-1966).* To assist in organizing a treponematoses control project and for concomitant smallpox and leprosy control activities.

Yaws: 3rd quarter 1964: In Anécho district (Région Maritime) 62,437 persons were re-examined during the first resurvey of which 1.7 per cent were still found to be infectious yaws.

4th quarter 1964: There were 19,639 persons re-examined of which 1.7 per cent were found infectious. A second resurvey commenced shortly after the completion of the first one during which 19,057 persons were re-examined and only 20 (0.1 per cent) infectious cases were found this time. Juvenile mass treatment is being employed.

Smallpox: During the third quarter 1964 a total of 53,167 smallpox vaccinations were carried out of which 9453 were vaccinated in Anécho district, (Région Maritime) the rest in other parts of the country. Take rates of 89 per cent in primo-vaccinations were found. Of 1092 revaccinations only 330 (30 per cent) showed reactivity.

In the fourth quarter 100,431 persons were vaccinated of which 5677 were read: of 3345 primo-vaccinations 2550 (77 per cent) showed positive reaction, while of 2332 revaccinations 1011 (44 per cent) showed positive reaction.

PUBLIC HEALTH LABORATORY. To assist development of health laboratory services.

EPIDEMIOLOGICAL SERVICES (- 1968). To continue assistance in organizing epidemiological services.

NURSING ADVISORY SERVICES (August 1963-1968). To assist the strengthening of programs for the education of nurses and midwives at all levels.

During this period a survey of the nursing resources and needs of Togo has been carried out in collaboration with the principal nurse educator.

The WHO nurse educator continues to advise regarding the development of the program of the basic school of nursing, and to assist with theoretical and practical teaching for all groups of nursing personnel. She has also participated in the development of the rural health center at Vogan and the organization and carrying out of refresher courses for existing nursing and midwifery personnel. The aim of these courses has been to provide an orientation to public health nursing.

* This project receives UNICEF assistance.

HEALTH EDUCATION (1963-1966). To help the Government to extend the use of health education methods in the health services.

After a slow start, the project began to gather impetus during the period July - December 1964, and much activity was undertaken in the matter of training courses for health staff and for others associated with them in their work in the community. In particular, a great deal was done in association with other members of the health team, in the demonstration zone of Vogan. The dispensary staffs and the mobile health auxiliaries have commenced educational activities as a part of their normal duties, and the national health educator now acts as an adviser when the need arises; thus the educational activity is becoming part of the normal duties of the health staff, rather than something apart. Courses have continued for paramedical personnel with increasing emphasis on the practical aspects of the work.

The project has continued to assist with the health education aspects of the courses at the Malaria Eradication Training Centre in Lomé, particularly for the field visits.

ENVIRONMENTAL SANITATION PROGRAM (1962-1967).* To assist in the training of sanitation personnel; in setting up a sanitation unit in the Ministry of Health and in planning a long-term environmental sanitation program, starting with a pilot project.

The training program of sanitation staff continued as planned. At the Ecole d'Assistants d'Hygiène, Lomé, the second-year course was inaugurated and registration for 1964/1965 is six first-year and seven second-year students. Two candidates left in October 1964 for sanitarian studies; they are taking a two-year course at the Ecole de Génie Rural, Strasbourg, and one year at the Ecole de Santé publique, Rennes.

Work in the Nuatja pilot zone has begun with the construction of the first of the 20 wells protected against pollution. In the demonstration zone for basic health services at Vogan, the sanitation service has participated in the training program while the health assistant students have spent two months on sanitation surveys.

A WHO health inspector arrived in January 1965, assigned to the new post in the project. Operations continue satisfactorily in spite of the delay in training of a national sanitary engineer.

OTHER WHO PROJECTS

PUBLIC HEALTH ADMINISTRATION (1961-1964). To assist in drawing up a national plan covering from five to ten years for the development of health services.

WHO assistance came to an end in December 1964 after the plan established permitted the start of the project for training of medical, paramedical and auxiliary staff.

* This project receives UNICEF assistance.

The malaria eradication project, the aims of which are complementary to the other project, is an asset to the harmonious development of health services in Togo.

MALARIA ERADICATION SPECIAL ACCOUNT (MESA)

A supplement to the provision of the regular and the technical assistance budgets was allocated by MESA for the years 1965 to 1967 successively \$11,000, \$12,000 and \$52,000.

Table 36

UNICEF-Aided Projects in Togo, 1960-1964

Total allocation: \$169,000

MATERNAL AND CHILD HEALTH AND ENVIRONMENTAL SANITATION	Approved 1961 \$ 81,800
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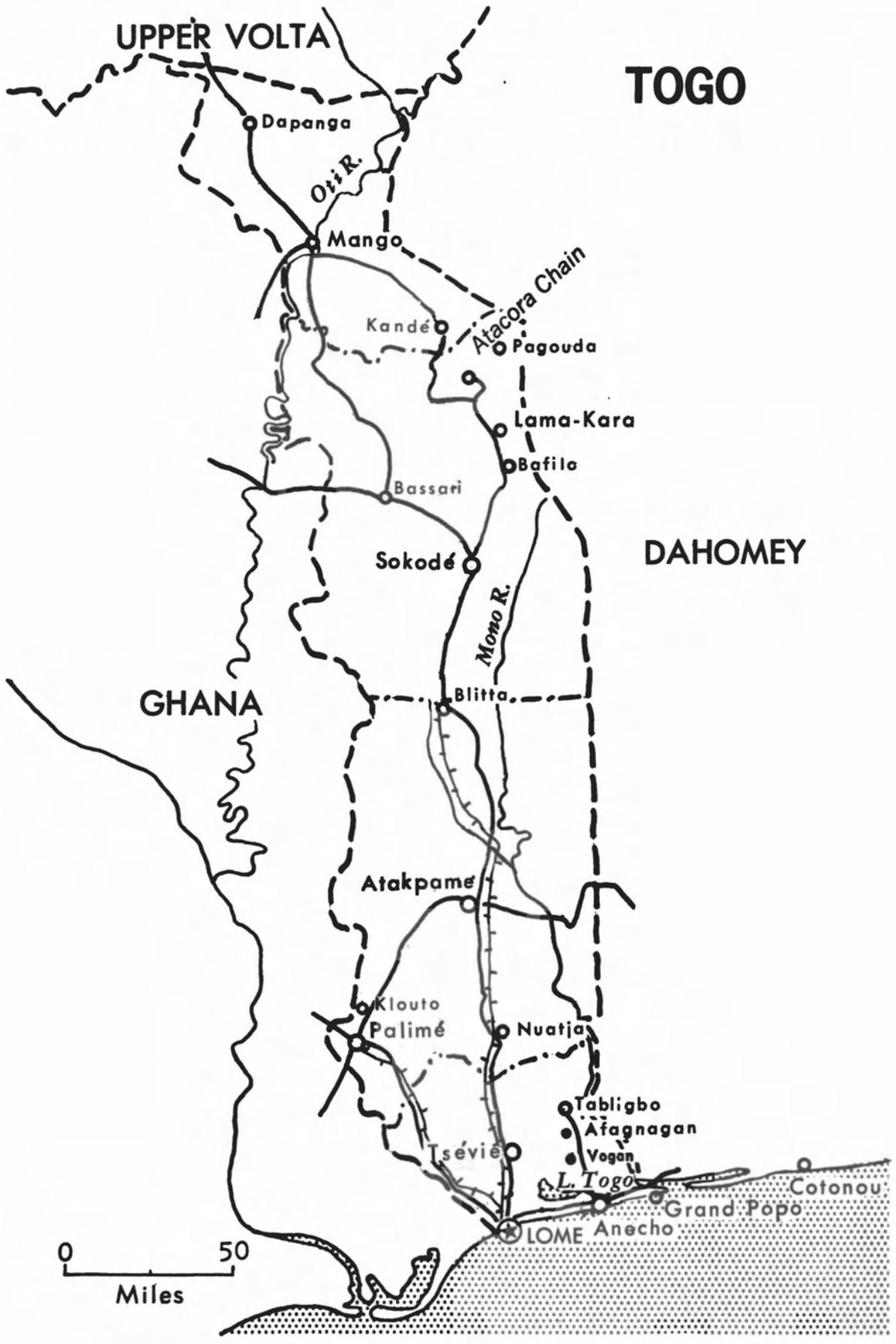
Since 1961, 10 new rural maternities have been built and equipped by UNICEF. Equipment for training, laboratories, health education, workshops and well construction; transport and stipends. WHO is providing a nurse educator, a sanitary engineer, a health educator, a public health adviser and six fellowships.

YAWS CONTROL	Approved 1960-64 \$ 49,000
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In connection with the activities of seven mobile units in yaws control, UNICEF is providing drugs, laboratory and field equipment and transport and WHO a doctor and laboratory technician.

SOCIAL SERVICES	Approved 1964 \$ 35,000
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Social workers are being trained in the School of Social Work in Abidjan, Ivory Coast. UNICEF is providing for this school teaching and training equipment, vehicles, stipends, fellowships and the salary of a FAO homecraft teacher.



MALAGASY REPUBLIC—MADAGASCAR

Population:	6 million	Number of doctors:	600
Area:	229,000 sq. mi.	Doctors per population:	1:10,000
Capital:	Tananarive	Hospital beds:	15,710 or 1:382

GENERAL

Geography and topography. Madagascar, the fourth largest island of the world, lies in the Indian Ocean between approximately 12° and 25° south latitude. All but its southernmost sixth lies within the tropics. It is 1000 miles long and about 360 miles wide at its widest, and has a total area of approximately 229,000 square miles. The island is separated from the mainland of Africa by the Mozambique Channel, 240 miles at its narrowest.

The chief physical feature of the island is a central plateau extending along almost its whole length and rising to 4000-5000 feet with peaks up to 8000 feet. From the west there is a progressive slope from the alluvial plains up to the plateau. To the east (except in the extreme south), the plateau drops in two sharp escarpments to a narrow plain separating it from the sea. The southern portion of the island is arid, sandy, semi-desert. In the western plains there are many fertile river valleys. In the northeast, the courses of the rivers are short and precipitous.

The climate of the eastern lowlands is conditioned by the northeast monsoons: rain falls almost throughout the year, and annual rainfall varies from 100 to 127 inches; humidity is always high, and the average temperature is 75°-77° F. The western plains are somewhat hotter, with a greater temperature fluctuation—there is a hot season from November to April and a cold season from May to October. The average rainfall varies from 40 inches in the extreme north to a maximum of nearly 60 inches in the northwest and to 14 inches in the south. On the plateau there are corresponding hot and cold seasons; rainfall, concentrated between December and April, and often occurring in torrential storms, averages about 50 inches.

Population. In 1964, the population was estimated at 6 million. Some French and American sources estimate the current growth rate at 2.7 per cent. On the basis of a 2.5 per cent growth rate, the Malagasy Commissariat au Plan estimated in 1961 that by 1975 the population would reach 7.7 million. However, more precise studies (based on the assumption that public health measures will spread throughout the island and the fertility rate and infant mortality will reach about the level observed in the Tananarive Province) yield an estimate of 8.6 million by 1976.

In 1962, the birth rate of the island was estimated at 40 and the general mortality at 15 per 1000 population.

The average density is estimated at 26 persons per square mile; heavily populated portions of the central plateau and the east coast have densities of more than 100 per square mile, whereas portions of the arid south and west average 4-10.

The major cities are the capitals of the six provinces (the city and the province of which it is the capital bear the same name); their estimated populations are: Tananarive (also the national capital) 255,000, Tamatave and Majunga 50,000 each; Tuléar and Diego-Suarez 40,000 each, and Fianarantsoa 35,000. Two smaller centers are Antsirabé (30,000) and Mananjary (13,000).

Major tribes are: Hova or Merina, central plateau, about 25 per cent of the population; Betsimisaraka, east coast, 15 per cent, Betsileo, south central plateau and east coast, 12 per cent; Tsimihety, north, 7 per cent; Sakalava, west coast, Antaisaka, southwest, and Antandroy, south, 4-6 per cent each. The foreign population, of which resident French constitute more than half, averages about 3 per cent of the total population.

The Malagasy are a people of mixed racial backgrounds united by a common language and by their insular position. Ethnically, they are a mixture of Malay, Indonesian, Melanesian, Arab and Negro. The earliest settlers were probably voyagers from the Sunda Isles (Indonesia). A relatively late-coming tribe, the Hova or Merina, settled in the salubrious plateau and by the late eighteenth century dominated the whole island. In the reign of Merina King Radama (1810-1828) many features of European culture were introduced, including Christianity and munitions. King Radama also banned the slave trade and introduced the linguistic reform that converted the Malagasy language to the Latin alphabet with the adoption of French vowels and English consonants, each letter always pronounced the same way.

Christianity is the religion of the dominant portion of the population; there are more than 10,000 protestant and catholic churches and nearly 100 mosques.

Government. Madagascar became a French colony in 1896, elected to become an autonomous republic of the French Community (October 14, 1958), and became the independent Malagasy Republic on June 26, 1960. Despite a bloody surprise attack by Malagasy independence forces in March 1947 against French settlers, officials and army garrisons, relations with the French have generally been cordial, as they are today.

Philibert Tsiranana, who founded Madagascar's Social Democratic Party and was head of the provisional government, has served as president since May 1, 1959. He was re-elected to a second seven-year term in March 1965. There are several political parties, but the President's Parti social démocrate has so far had a safe majority, holding over 95 of the 107 seats in the National Assembly. One of the small opposition parties (Parti du congrès de l'indépendance de Madagascar) is regarded as pro-Communist.

The country is divided into six provinces comprising 19 prefectures, 91 sub-prefectures, 45 arrondissements and 691 cantons. There are 26 self-governing urban communities and 739 rural communes. The provinces and their prefectures are: Tananarive (Tananarive, Imerina centrale, Vakinankaratra, Itasy), Majunga (Majunga, Antsohihy, Maintirano), Tamatave (Tamatave, Fénériver, Ambatondrazaka), Fianarantsoa (Fianarantsoa, Farafagana, Mananjary), Tuléar (Tuléar, Fort-Dauphin, Morondava), and Diego-Suarez (Diego-Suarez, Nossi-Bé, Antalaha).

Each province is governed by an executive officer (secrétaire d'état), named by the chief of state, assisted by an elected general council. The province's

delegation to the national legislature—its national assemblymen and senators—also serve on the provincial general council.

Madagascar is a member of the United Nations and its specialized agencies and of the OAU and OCAM; it is an associate member of the European Economic Community.

On July 1, 1963, the Malagasy franc (FM), equal in value to the CFA franc, was adopted as the official currency.

Education. The national education budget for 1965 totalled nearly \$5.5 million or about 6 per cent of the central government operating budget. One half of the education budget was expended for personnel. Nearly 20 per cent (\$1 million) was earmarked for teacher training and \$205,000 for training of medical personnel. There were 2390 persons engaged in education at the national level, of whom 950 were technical assistance personnel. As is the case with health, education receives substantial additional support from the provincial budgets.

Education is compulsory from 6-14 years of age (primary school) and nearly half the population is literate. Nationwide, between 50-55 per cent of school-age children are in school; the rate is over 90 per cent in some highland and east coast districts and as low as 2 per cent in some parts of the south.

In 1964-1965 there were 595,642 pupils in private and public primary schools, with a teaching staff of 8255; there were 41,637 secondary school students (56 per cent enrolled in the seven-year program leading to the baccalauréat) and 1710 secondary school teachers.

Private schools, sponsored principally by churches and missions, are an important factor in the primary and secondary school systems. In 1961, 48.7 per cent of the 2358 primary schools were private, with 52.2 per cent of primary pupils; of 48 secondary schools offering the baccalauréat, the 39 private schools had 55 per cent of the total enrollment; of 150 high schools offering the shorter secondary school course, 120 (with 64 per cent of the total enrollment of 12,000) were private.

In 1961, technical training at secondary school level was offered at the Lycée technique in Tananarive and in several provincial lycées and high schools, and at a civil engineering school, a business college, 2 home economic schools and 16 apprentice centers. There were also in 1961, 92 public and private trade schools for training primary school graduates in carpentry and mechanical trades. The school for rural leaders and livestock assistants awards the Brevet élémentaire after a two-year course. A forestry school is at Ambatobe. In addition to the college of agriculture at the University of Madagascar, there are agricultural schools at Nanisana, Ambatondrazaka, Marovoay and Ivoloina. The government is seeking to encourage enrollments (which are at present too low) in secondary and college agricultural training.

Normal schools train primary school teachers (four years of general studies and one of teacher training); in 1961 there were seven normal schools, including one for girls; there were 1500 students and 275 graduates.

Malagasy's goal under the development program is to increase the rate of school-age children in school from 50 per cent to 75 per cent by 1975. It is estimated that this will require training of 10,000 new teachers, the creation

of at least 30 new public high schools, and hundreds of primary schools. The major problems are the shortage of teachers and the adaptation of the prevailing French curricula to practical Malagasy needs.

In the next decade, the government plans to open 8000 new rural primary schools with four-year courses of practical instruction in better methods of farming and preparing foods. The plans of the Ministries of Health, Education and Agriculture are coordinated in this program. Complementary programs will train more teachers and agriculture extension workers and develop short, intensive programs for community leaders and adult peasants. Practical one-week courses in agriculture and nutrition are now being offered to approximately 5000 farmers and their wives each year.

The Institut de recherche et de formation pedagogique, opened at Tananarive in 1964, will be primarily responsible for the secondary teacher training program. Financed jointly by FAC, UNESCO, and the Malagasy government, the Institute is affiliated with the University of Madagascar and has a staff of eight foreign experts in education, headed by a Swiss. In the next decade the Institute is expected to train enough teachers to man the 30 new high schools, replace technical assistance personnel now in secondary schools, and furnish some cadres for technical schools and lycées.

College enrollment has doubled in recent years, rising from 1380 in 1960-1961 to 2700 in 1963-1964. By the early 1970's college enrollment is expected to reach 10,000. Some students from East Africa attend schools of the University of Madagascar; e.g., 12 students from Kenya are attending the teacher's college in 1965-1966.

In 1963-1964, 63 per cent or 1700 of the 2700 college students were studying in Madagascar; 37 per cent or 1000 attended universities in France, most of them on scholarships.

The University of Madagascar, which opened in 1961, has faculties of law and economics, medicine, science, and letters; its special schools, some of which opened as early as 1954, include the école nationale d'administration, école nationale des travaux publics, école nationale de l'agriculture, the institut de recherche et de formation pedagogique described above, and the institut de promotion sociale (which studies development problems and trains cadres for the development program).

The rector of the university is René Roblot. The teaching staff of the regular faculties in 1964 comprised 97 persons, of whom 17 were Malagasy; 39 were in the faculty of science, 28 in letters, 17 in law, 6 in the faculty of medicine.

French aid (FAC) underwrites construction costs which, when the university is completed in 1970, are expected to total \$16 million. France is also financing the greater part of the annual university budget, although Malagasy is assuming a larger proportion of expenses each year; of an estimated budget of \$3.2 million in 1964-1965, France was to contribute more than 90 per cent. (See also page 128.)

The Medical Faculty of the University of Madagascar or the National School of Medicine and Pharmacy was opened in 1961. It will offer, when all six-year courses will be provided, a full curriculum leading to the French State diploma

of doctor of medicine which will be fully valid in France. Meanwhile, the students who have completed the first year continue their studies at faculties of medicine in France. There are about 120 medical and paramedical students abroad at present.

The School of Medicine and Pharmacy of Tananarive (Ecole de Médecine et de Pharmacie, Befelatanana, Tananarive) was founded in 1896. It offers after one preparatory year and four years of study a diploma of Médecine de l'Assistance médicale de Madagascar (or diplôme de Tananarive). The total enrollment (1963) was 145 and admissions 20. The teaching staff includes 16 full-time and 6 part-time teachers. Teaching at this school has been adapted to the needs of the rural physician in Madagascar* (see curriculum on pages 142-143).

The School of Nursing and the School of Midwifery connected with the Tananarive School of Medicine and Pharmacy award the diplôme d'état.

Attached to the Tananarive School is a school for assistant anesthesiologists (two years of study) and a school of stomatology training dentists (18 months of postgraduate study).

ECONOMIC RESOURCES

The agricultural sector occupies 90 per cent of the 2.5 million persons economically active and contributes 54 per cent to the national product, whereas commerce and services contribute about 30 per cent. For 1965, the gross national product was estimated by American sources as about \$650 million or a per capita value of \$110 (French sources estimate per capita cash income, exclusive of subsistence, at \$40).

The 1964-1968 development plan involves an investment of \$668.5 million, of which 51 per cent is scheduled for infrastructure and transportation; 23 per cent for agriculture; 17 per cent for industry and 9 per cent for social sector (the sector which includes health and education). Of the \$668.5 million, some \$125.6 million or about 19 per cent was to come from foreign assistance. Goals of the development program are: 40 per cent increase in agricultural production, 26 per cent in forests, 39 per cent in foreign trade, 46 per cent in domestic trade, 128 per cent in industry, and 2.5 per cent in domestic consumption.

Major cash crops are coffee, sugar cane, vanilla, cloves, and rice. Zebu cattle, still regarded in many cases as a status symbol rather than a source of cash, are numerous; stockraising is concentrated in Majunga, Tuléar, Fianarantsoa and Tananarive provinces. Crop harvests in 1964-1965 were reduced by a series of cyclones and smashing rains. These storms ruined many rice fields and harmed other crops, which were further damaged by the worst rat invasion since 1916 and by plagues of locusts. Following is a capsule description of the provinces as related to economic resources:

Diégo-Suarez, north, fertile valleys of volcanic soils; sugar cane, coffee, vanilla, pepper, cloves. It is cut off from the rest of the island by Mt. Tsaratanana (9450 feet), but ocean-going ships can dock at its port.

* Association de la recherche médicale en Afrique occidentale et de Médecine d'Afrique noire: Colloques de Santé publique, 4-10 janvier 1965. Quatrièmes Journées Médicales de Dakar, Dakar, 1965.

Majunga, northwest, fine alluvial soil in many river valleys; exports rice, also produces tobacco, peanuts, cassava and cotton. Big ships can dock at Majunga.

Tuléar (west) and Majunga (southern part), making up the west coast of the island, share several navigable rivers (Manambolo, navigable for 100 miles inland; Tsiribihina, 86 mi., Mangoky, 151 mi., Onilahy 134 mi., Betsiboka 128 mi., Mahavavy 126 mi.); will be much greater rice producer when irrigation projects are completed.

Tuléar (southern part), arid, sparsely populated, used for grazing, potentially rich (minerals are coal, mica, iron, manganese), and irrigation would make rice and other crops possible; freight must be handled by lighter, but a modern coal port is under construction (Soalara).

Tananarive province and much of Fianarantsoa lie in the healthful plateau in the center and south center of the island; prosperous, well-populated, more diversified economy than in any other part of the island; stockraising and rice are the main agricultural pursuits; railroad connects points on the plateau with the east coast port of Tamatave.

Tamatave province, a long, narrow strip on the east coast, grows much coffee, rice and sugar cane. Tamatave is the major island port, deep enough for ocean-going vessels to dock, and a collection point for freight to and from the highlands and from the east coast via the Pangalanes Canal.

Industrial development is hampered by the smallness of the domestic market and by transportation costs both intra-island and overseas. Processing industries exist for the agricultural products—rice, cassava, cocoa, sugar cane, peanuts, sisal and cloves. There are meat and vegetable canneries, soap factories, tanneries, and cement works. Construction of the first petroleum oil refinery (Tamatave) began in October 1965. The government owns 15 per cent of the stock, which can be increased to 33 per cent later. The refinery will produce 500,000 tons annually when full production is reached in 1968.

Exploitation of minerals is proceeding in response to demand. Uranium and thorium in the south are being mined, as is mica, also chiefly in the south. In late 1965 the government contracted with a private firm for feasibility studies for exploitation of chromite estimated at 3 million tons, 100 miles from Tananarive—this project represents an investment of \$4 million. The chromite at Tanomena is estimated at 400,000 tons, and nickel deposits at Valoroza at about 70,000 tons. High quality graphite is found in the high plateaus and south of Tamatave on the east coast. Coal reserves in the Sakoa area of Tuléar are estimated at 3 billion tons. The industrial complex planned for the coal region represents an investment of \$62 million and will ultimately include mining facilities to produce 480,000 tons of coal per year, a central thermal power plant, cement plant of 150,000 tons annual capacity, and a chemical factory to produce 200,000 tons of fertilizer per year.

Since 1960 production of electricity has increased about 5 per cent per year; in 1964, 93 million kwh were produced. Dams have been built on the Mandraka and Tsiacompaniry Rivers (west coast) and great potentialities exist for hydroelectric power in the Fatita, Ikopa and Betsiboka falls.

Overland transportation routes are difficult and expensive to establish because of the topography; much intra-island freight is transported by water—via

rivers on the west coast, via the Pangalanes Canal on the east coast from Farafangana to Tamatave and from one coastal port to another by sea. Of the 18 island ports, 3 (Tamatave, Diégo-Suarez and Majunga) which can receive large vessels are being improved.

The railroad (532 miles) has a trunk line from Tamatave (east coast) to Tananarive. In the highlands, one branch line runs north to Lake Alaotra and Moramanga, another south to Antsirabé. The other branch line, on the east coast, (Manakara to Fianarantsoa) is being extended from Fianarantsoa to Antsirabé. Engines (about 80) are diesels. Traffic in 1963 amounted to 147,873,007 passenger kilometers and 162,966,571 ton-kilometers of freight.

In 1964 there were about 20,000 miles of roads, of which 1200 were surfaced and another 4000 operable in all seasons. Highway improvement is a priority under the development program and much road-building is being undertaken, particularly in the northwest.

Air transportation is a fast-growing industry, with 65 airports, 3 of which are large enough for jets. Intra-island air traffic in 1963 was estimated at 110,000 passengers and 7000 tons of freight.

Exports in 1964 were estimated at \$91.2 million and imports at \$134.9 million. Principal exports are coffee, sugar, sisal, rice, vanilla, and tobacco. It is estimated that about 75,000 additional tons of sugar could be exported if markets could be found. France is the main trader, supplying 75 per cent of imports and receiving 57 per cent of exports. The United States in 1964 received 14 per cent of exports, mainly coffee and vanilla.

NATIONAL BUDGET

Budgetary data, including the health budget and its relation to the central government operating budget (in amounts and in percentages) and estimated health expenditures per capita are set forth below (in thousands):

Year	Total Budget	Central Government Operating Budget	Health Budget	Per cent of Operating Budget	Health Costs Per Capita*
1961	\$79,287	\$79,287	\$5,183	6.5	\$0.86
1962	90,575	83,043	5,219	6.3	0.87
1963	88,675	79,887	5,759	7.2	0.96
1964	96,130	86,665	5,916	6.8	0.99
1965	104,538	91,900	6,106	6.6	1.02

*Based on estimated population of 6 million in 1964.

Personnel expenditures in the annual national health budgets for recent years are 58-60 per cent of the budget.

Sizable appropriations in the provincial budgets supplement the national budget. In 1964, budgets of the six provinces averaged over 23 per cent for health, ranging from a low of 21 per cent in Majunga to 26 per cent in Tamatave. When both national and provincial budgets are considered, the health expenditure is 10 per cent of the combined budgets or a per capita expenditure of about \$1.95.

ASSISTANCE PROGRAMS

Bilateral. French investment in health activities through FAC from 1959 to February 25, 1964 totalled \$1,723,000 or 2.26 per cent of the nearly \$76 million supplied by FAC in that period. The largest health investments were for the hospitals at Maroantsetra, Tuléar, Majunga, Vohémar, Mananjary and Antsirabé—\$751,000. Other projects included a maternal and child health center—\$203,000, extension of provincial health services—\$142,000, campaigns against tuberculosis and venereal diseases—\$102,000, purchases of vehicles for health services—\$61,000, completion of Girard and Robic Hospital—\$284,000, and the campaign against endemic diseases—\$162,000.

FAC has also financed the new BCG laboratory at the Pasteur Institute of Tananarive—\$122,000.

U.S. AID totalled \$530,000 in development grants and technical cooperation in FY 63, of which \$228,000 was for health and sanitation; in FY 64, of the total of \$754,000, \$171,000 was for health and sanitation; in FY 65, of a total of \$3.819 million, \$517,000 was for health and sanitation projects. One continuing project of U.S. AID is ground water development for village water supplies, including furnishing a well driller and sanitary engineer, begun in 1962 and estimated to be completed in 1967 at a cost of \$526,000. U.S. AID has supplied ambulances, radiological equipment and furnished hospital operating rooms.

Donations of U.S. surplus agriculture commodities under PL 480, Title III, through June 30, 1965 were of the value of \$1,917,000 (of which \$1,846,000 was committed in FY 63, 64 and 65).

Under its technical cooperation agreement (1962), West Germany has advanced \$8.125 million in long-term loans; supplied boats and jeeps to the military services; trained seamen and forestry engineers in Germany; helped finance a match factory and the Mampikony-Port Berger Highway, and supplied engineering services and other assistance in town-planning, communications and agricultural projects.

In 1964, the Swiss Federal Council contributed \$2.24 million to be used by the Swiss branch of the Société des missions evangeliques de Paris to construct and manage a school at Majunga. Under the Swiss cooperation agreement (1964) several teachers have been furnished.

Under a three-year economic and technical cooperation agreement signed in 1964, Italy is believed to be considering erection of a factory to process algae and other foods, and a cement plant, and will furnish engineers for the highway development program.

Under its agreement for technical cooperation in the fields of agriculture, industry and cultural and social affairs (1961), Israel has supplied experts to organize courses in hospital administration.

China (Taiwan) is furnishing, under its cooperation agreement signed in 1964, tuna boats to help expand Malagasy's fishing industry.

In late 1965 Australia made an agreement under which she will supply scholarships to Malagasy students.

Multilateral. From 1958 to June 30, 1964, FED financial commitments in Madagascar totalled \$53.5 million for 40 projects. Of this amount, health and sanitation projects amounted to \$2.4 million (see Table 3, page 70), of which \$1.3 million represented the investment program for health infrastructure relating to the building of a hospital pavilion at Majunga (\$442,000) and the hospitals at Manakara (\$405,000) and at Fort-Dauphin (\$405,000).

Project costs of the United Nations Expanded Program of Technical Assistance for Madagascar in 1964 totalled \$517,156, and covered the services of 29 experts and 24 fellowships awarded to nationals. Included was assistance from UNTA for natural resources development and power (\$86,450); from ILO for small-scale industry and study of labor conditions and administration (\$62,121); from FAO for rural institutions and services, fisheries and forestry development and animal production and health (\$146,703); from UNESCO for education, public libraries and for scientific research (\$113,026); and from WHO for medical education and tuberculosis control (\$88,851).

WHO assistance programs during 1965-1967 (see Table 37) relate to the continuation of malaria pre-eradication activities, plague control, rural health services, nutrition, environmental sanitation, training of medical and auxiliary personnel, advisory services in medical education and fellowships.

UNICEF has provided funds for projects relating to health centers, training of paramedical personnel, health education, leprosy control, nutrition training in rural areas, education and rural development (see Table 38).

In January 1966, the United Nations Development Program/Special Fund approved a four-year project for development of the forest industry, to be executed through the FAO, to include forest inventory as well as marketing and industrial feasibility studies, and to cost \$753,400 from the Fund plus Malagasy contributions of \$477,000. UN Special Funds technical assistance to Madagascar for 1965-1966 is about \$856,000, principally devoted to mining, to cooperatives, improvement of rural institutions and development of fisheries; it also includes 28 scholarships for technical studies abroad by Malagasy students.

The UN Special Fund and the FED have assisted in development projects in the arid regions of Madagascar; the Special Fund contributed over \$1 million for a three-year project of surveys of mineral resources and research for underground water in the south, and FED contributed an equal amount for wells south of Morondava on the west coast and Mananjary on the east coast. UN Special Funds also supplied \$350,000 for an 18-month study of unifying rail lines (Antsirabé-Fianarantsoa) and for increased railroad track.

IHRD sent a study mission to Madagascar in February 1965 to review proposed projects for investment—water works for agriculture, construction of barrages, and irrigation canals in the areas of Morondava, Marovoay and Lake Alaotra. Other projects proposed for IHRD financing are the Majunga road, agricultural projects in the west and around Lake Alaotra, a match factory, and construction of a high tension line across Antsirabé.

ORGANIZATION OF HEALTH SERVICES

The Ministry of Health and Population was reorganized in 1960. In August 1965 the functions of the Ministry were absorbed by the newly created Ministry of

Social Affairs under Calvin Tsiebo who also acts as the vice-president of the government. The Secretary of State for Public Health (Celestin Aridy) is responsible for the health services of the Ministry.

The precise structure of the directorate general of public health is not available. It is known, however, that the technical directorate of health and medical services (Director: Dr. C. V. Randrianarison) includes central services dealing with maternal and child health, nutrition, environmental sanitation and nursing staff. A department of preventive medicine, set up in 1964, includes technical services relating to the control of malaria, tuberculosis, leprosy, venereal diseases and plague. There is also the central service dealing with the mobile health groups (groupes mobiles d'hygiène, GMH) and a central government drugs and medical supplies office.

The Pasteur Institute and the Institut de Recherche Scientifique cooperate actively in the control of endemic diseases.

Peripheral health services are linked with the provincial administration under the Secretary of State responsible for the administration of each of the six provinces. The provinces have their own health budgets. Regional health problems are discussed periodically at the inter-provincial health conferences.

The mobile health services (GMH) formerly controlled centrally are now attached to the provincial health administration. The role of the GMH is now oriented towards prevention and treatment of disease rather than to case-finding and survey activities.

In 1964 medical personnel in the government health service included 420 doctors, 30 dentists, 25 pharmacists, 511 midwives and 1639 nurses. There were in private practice about 180 doctors and 47 pharmacists (it is not known whether this total includes the several missionary doctors and other personnel serving at medical missions).

As of September 1965 the Malagasy government had received 68 French physicians under technical assistance out of 76 requested.

There is a shortage of qualified personnel. In 1964, for instance, the budget provided for 314 doctors (diplôme de Tananarive) but only 276 positions were filled; out of 686 posts for midwives, only 511 were filled.

Of 179 doctors practicing privately, 45 have the diplôme d'état, 6 are graduates of the University of Madagascar and 128 have the diploma of the Tananarive School. Most of them—127 of the 179—are located in Tananarive.

In 1960, about 45 per cent of government doctors, 74 per cent of the midwives and 54 per cent of the nurses were serving in rural areas; there were 437 facilities in rural areas (medical center, maternity, infirmary or dispensary) and the average population per facility in rural districts nationwide was 1:11,000, ranging from a high of 1:7000 in the rural highlands and east and west coasts, to more than 1:30,000 in several districts of the north and south.

The doctor/population ratio, based on government physicians only (420), in a population of 6 million (1964), is 1:14,286. Based on both government and private doctors (600), the nationwide average ratio for the same period is 1:10,000.

However, the doctor/population ratio in rural areas (which account for 94 per cent of the total population) was estimated in 1961 as follows by provinces: Tananarive 1:17,000; Majunga, Diégo-Suarez, and Tuléar 1:22,000 each; Tamatave 1:28,000; and Fianarantsoa 1:35,000.

Government medical facilities include 2 hospitals in Tananarive (the central hospital of Befelatanana and the Girard and Robic Hospital entirely financed by the French Government), 5 hospitals in each of the 5 provincial capitals (Fianarantsoa, Tamatave, Majunga, Diégo-Suarez and Tuléar) and five secondary hospitals at Nossi-Bé, Antalaha, Moramanga, Farafangana, and Ambovombe; 146 medical centers (most with midwifery wards), 299 infirmaries, 102 dispensaries, and 4 special institutions, including 1 children's hospital, 1 psychiatric hospital, 1 sanatorium and 1 re-education center for poliomyelitis patients.

There are further 7 polyclinics (2 in Tananarive and 1 each in 5 other provincial capitals); 7 maternal and child health centers (of which 2 are in the capital) and smaller centers in each of the medical centers with midwifery wards (137). There are 4 laboratories in Tananarive (in the 2 hospitals, the Institut d'Hygiene sociale and the Pasteur Institute) and 1 in each of the provincial hospitals.

There were in 1964, 44 private medical centers or hospitals (with a total of 1270 beds), including two hospitals operated by the American Lutheran Church with a staff including 12 American personnel of which 2 were doctors.

In 1964 there were a total of 15,710 beds, of which 14,440 were in the government health service and 1270 in private health facilities. Of the public health service beds, 1396 were in Tananarive hospitals, 2453 in the five provincial hospitals, 7146 in the secondary hospitals and medical centers, 3446 in infirmaries. They included, by specialties, 6016 maternity beds (government) and 258 (private); more than 1000 tuberculosis beds; 337 for contagious diseases; and a total of 1330 for lepers (500 government and 830 private); and 846 beds for mental patients.

The hospital bed/population ratio is 1:382 on the combined government (14,440) and private (1270) beds in 1964; 1:416 on the basis of government beds alone.

The Five-Year Plan, 1964-1968 (see page 80) provides for the modernization and re-equipment of a hospital in each of the 19 prefectures, giving priority to the more isolated areas. In December 1965, FED announced a grant of \$6.5 million for the construction and equipment at Betsimitatatra of the hospital center of the University of Madagascar.

PUBLIC HEALTH PROBLEMS

The state of health of the population of Madagascar is, as is known, on a much higher level than in most countries of Africa and Asia. The island is free from yellow fever, trypanosomiasis and smallpox. It is also believed to be free from onchocerciasis and loiasis.

Although vital statistics are still unreliable, Madagascar appears to be the only country covered by this study having a high rate of population increase which may require careful planning of future needs in food resources, education, public health and employment.

Control of endemic diseases, expansion of preventive and curative services to all rural areas of the island and the improvement of nutrition—are the main objectives of the health administration. To attain those objectives, highest priority is given to the training of medical, paramedical and medico-social personnel and to health education of the population in close cooperation with rural development services.

The main disease problems requiring continuous vigilance and action include tuberculosis, malaria, leprosy, bilharziasis and venereal diseases. Filariasis, dysenteries, plague, poliomyelitis and measles also require attention.

The following is a brief reference to some of the disease problems.

Tuberculosis has been diagnosed in human beings since 1877, and in cattle since 1901. BCG vaccination has been carried on since 1925, and the Pasteur Institute now makes 150,000 doses annually for local use. Nevertheless, tuberculosis remains a common disease. A random sample of 1100 out of the 5000 case notes in the Tananarive tuberculosis dispensary showed that 21.09 per cent of cases were under ten years old when diagnosed. The Pasteur Institute found non-pulmonary tuberculosis in 325 out of 13,096 miscellaneous pathological examinations between 1954 and 1961. Case-finding activities included in 1964 some 119,000 X-ray examinations; 54,000 were examined and 9000 found positive in connection with BCG vaccination. Among 5891 known cases (1964) of pulmonary tuberculosis, 2612 were hospitalized.

The vectors of malaria, as on the continent, are Anopheles gambiae and A. funestus. Malaria first established itself in the coastal plains of the east, where it became a truly ravaging disease. As European settlement was extended to the plateau, the vector mosquitoes and the disease followed and there were severe epidemics above 3600 feet altitude. The systematic weekly distribution of anti-malarial drugs to children under 15 years of age was initiated in 1947; this was never envisaged as a malaria control measure, but was intended merely to minimize the effects of the disease in children. At present, 1,250,000 children are benefiting from this service, and the results have been excellent. Residual spraying campaigns have eradicated A. funestus at all levels above 3000 feet. A. gambiae persists, but malaria transmission has virtually been ended on the plateau. It persists in the eastern lowlands, but is now only hypoendemic. In 1964, 56,000 cases were seen by the health authorities, of which 3500 were hospitalized. The 56,000 cases were distributed as follows by provinces: Tamatave (east coast) 14,000, Diégo-Suarez (north) 13,000, Majunga (northwest) 12,000, Fianarantsoa (east coast) 10,000, Tuléar (south) 7000, and less than 400 in Tananarive Province.

Before the antimalaria campaign commenced, Plasmodium vivax and P. falciparum were equally common. Now P. vivax has become rare.

Mass treatment of lepers with sulfone drugs was begun by the central leprosy service in 1954. Recent surveys indicate a total of about 35,000 cases. Of 28,700 registered cases, 24,000 are under treatment, 18,000 of them regularly. About 1100 cases are under observation without treatment and 1200 have been arrested. Approximately 3000 new cases are traced per year, the majority are found near the east coast. Ten per cent of the new cases are contagious and require hospitalization. There are 24 resident leper communities. Case-finding and treatment are handled increasingly by the fixed treatment centers of which there

were 641 at the end of 1963, and there are some bicycle circuits. Fourteen leprosy inspectors were trained during 1964.

Almost the whole island has been surveyed for bilharziasis. Schistosoma haematobium occurs throughout, and is proving to be a serious obstacle to the development of irrigation farming. S. mansoni occurs in scattered foci, many in the southeast and a few in the north and southwest.

Filariasis is found almost everywhere in the east and north of the island, with some foci of over 20 per cent infection. Elephantiasis is common. The prevailing filarial species is a variant of Wuchereria bancrofti, W. bancrofti var. vauceli.

Plague was formerly a serious problem, until a program of vaccination using a vaccine prepared by the Pasteur Institute at Tananarive, was initiated in 1935. The annual incidence reached 3879 (with 3715 deaths) in 1933 and fell to 913 cases (with 875 deaths) in 1937; 6 sporadic cases with 3 deaths were reported in 1964, and 7 cases in 5 areas of the provinces of Majunga, Tananarive and Fianarantsoa in 1965.

Plague is firmly enzootic in the wild rodents, and from time to time, a small epidemic of pneumonic plague, initiated from a sylvatic case, occurs on the plateau. Though under strict control, it remains as a potential threat.

Poliomyelitis was not commonly reported until an epidemic swept over most of southern Africa in 1946-1948. In Madagascar there were 121 cases in 1946 and 383 in 1947. In each of the years 1963 and 1964, 24 cases were reported (though the Pasteur Institute considers these figures to be an understatement of the true incidence).

Diphtheria is not uncommon; 807 cases were reported in 1964.

In 1964 some 29,000 cases of measles were seen by physicians, of which about 5000 were hospitalized.

Smallpox has not been reported since 1918, but the vaccination campaign is kept up and some 300,000 vaccinations are performed annually. The vaccine is prepared by the Pasteur Institute and the vaccine laboratory at Diégo-Suarez.

HEALTH DEVELOPMENT PLANS

The Health Plan integrated in the overall Five-Year Plan, 1964-1968 has been prepared by the Development Commission of Public Health Services of the Ministry of Health (see page 80). The contents of this Health Plan is not known but its main objectives were described (in 1962) as follows:

"Extend the action of public health services to all parts of the country and aim at the improvement of living conditions of the population through health education, environmental sanitation and better nutrition while continuing efforts to control the endemic diseases. These objectives imply the reorientation of the training of personnel and close cooperation with other government services to bring about the participation of the population in the health protection of their own communities. Clearly, curative and preventive medicine must be closely linked in rural areas but priority should be given to preventive medicine reaching a much more important share of the population."

Table 37

Estimated WHO Commitments in Madagascar, 1965-1967

<u>Project</u>	Number of Posts			Estimated Obligations		
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Malaria pre-eradication program	2	2	2	\$ 12,169	\$ 31,618	\$ 35,138
Plague control	-	-	-	9,600	10,200	10,200
Rural health services	2	2	3	41,741	39,204	48,207
Nutrition	1	1	1	11,420	13,769	15,652
Environmental sanitation	1	1	1	24,554	20,599	18,960
Training of medical and auxiliary personnel	-	-	-	3,750	-	-
Medical education	-	-	-	-	8,600	17,100
Fellowships	=	=	=	<u>1,950</u>	<u>-</u>	<u>20,000</u>
Total	<u>6</u>	<u>6</u>	<u>7</u>	<u>\$105,184</u>	<u>\$123,990</u>	<u>\$165,257</u>
Other obligations				\$134,000	\$126,000	\$127,000

MALARIA PRE-ERADICATION PROGRAM (1965-1972). To develop a network of basic health services on which a malaria eradication program for the whole of Madagascar can be built; to train personnel to form the nucleus of a national malaria service; to undertake a general survey of malaria epidemiology and to develop facilities for improving the diagnosis of malaria and increasing the availability of anti-malarial drugs.

PLAGUE CONTROL. To assist in finding out the causes of persistence of plague in certain areas of the country and to reinforce the control measures against this disease.

RURAL HEALTH SERVICES (1963-1968).* To assist in improving, strengthening and developing existing health services with emphasis on maternal and child health; to assist health activities within the scope of community development.

The public health adviser arrived in September 1963 and the maternal and child health adviser in September 1964. The work of the team has been concentrated

* This project receives UNICEF assistance.

in the region of Itaosy, which can be regarded as a demonstration zone from which activities can be extended by stages throughout the Republic.

A detailed plan of action for this zone has been prepared and submitted to the Ministry of Public Health and Population and approved by the Government.

The training of auxiliaries chosen from among the voluntary workers in the demonstration zone permitted undertaking activities such as smallpox vaccination and conducting socio-economic surveys among rural families.

NUTRITION (1965-1968).* To advise and assist in the development of a Nutrition Unit in the Ministry of Health, to undertake nutrition surveys, to train personnel to organize programs of nutrition education and to assess applied nutrition programs.

The WHO consultant began in April 1965 to establish in collaboration with the Ministry of Public Health and Population a program to develop nutrition activities within the Ministry. This program, which will deal principally with the training of personnel and organization of educational programs throughout the maternal and child health centers, must be integrated within the applied nutrition project which already benefits by assistance from FAO and UNICEF.

ENVIRONMENTAL SANITATION (1965-1968).* To assist in setting up a sanitary engineering unit in the Ministry of Health, in formulating a long-term sanitation program and in training personnel.

The draft of the plan of operations, received agreement in principle from the Government and UNICEF. The project began in January 1965 with the arrival of the WHO sanitary engineer at Tananarive. The initial activities of the project were directed towards the training program for sanitation and health assistants at the Tananarive school. The students for the school year 1964/1965 number 16 and they have been studying since September 1964.

OTHER WHO PROJECTS

TUBERCULOSIS CONTROL (1962-1964). To assist the Government in investigating the possibility of introducing tuberculosis control measures which would be acceptable to the population; to train national personnel.

Since no agreement had been reached regarding the continuation and expansion of this project to develop a nation-wide tuberculosis control program, the project was terminated by mid-1964, when WHO staff members were withdrawn. (The terms of reference of the project were to introduce BCG as a prophylactic measure in Madagascar, to study operational problems of such a mass campaign, and investigate the reaction of the population to such a standardized public health approach.)

The project during its comparatively short duration was not able to establish a nation-wide integrated BCG campaign as its activities were linked with a Government case-finding team under instructions to survey the population of various provincial towns. The project's activities proved however that the

* This project receives UNICEF assistance.

population accepts mass examination campaigns willingly, as shown by the high coverage achieved. It was also shown that case-finding and curative control measures do not give the desired results if they cannot be based on peripheral health units capable and willing to cooperate in such a tuberculosis program.

SPECIAL ACCOUNTS

A supplement to the provision of the regular budget was allocated by the Malaria Eradication Special Account for the years 1965 to 1967 successively \$1000, \$1000 and \$1500. Another supplement was granted by the Community Water Supply Special Account for 1965 in the amount of \$40,000.

Table 38

UNICEF-Aided Projects in Madagascar, 1960-1964

Total allocation: \$572,000

	Approved 1960
MATERNAL AND CHILD HEALTH (MCH)	\$ 178,000

UNICEF provided teaching and training equipment for the provincial schools for nurses and midwives and the two new schools for sanitarians and visiting nurses, MCH equipment, drugs, nurses' and midwives' kits; transport; stipends for 10 visiting nurses, 25 health assistants, 60 auxiliary midwives, 12 sanitation technicians, 70 sanitarians, 70 health educators. For this project UNICEF has also shipped 371,000 pounds of skim milk powder donated by the U.S. Government. WHO provided a team of six public health advisors.

UNICEF is providing basic equipment and expendable supplies for new rural health centers, training equipment and sanitation supplies for the demonstration area, transport; stipends for training visiting nurses and sanitarians. WHO resident experts provide technical advice.

	Approved 1960-64
LEPROSY CONTROL	\$ 26,000
	Additional commitment 22,000

UNICEF provided sulfone drugs, vehicles, bicycles, and sterilization and injection material to strengthen and expand the leprosy control project.

	Approved 1964
NUTRITION TRAINING	\$ 45,000
	Additional commitment 119,000

Training personnel to teach the farmer and his family better methods of production and home consumption of protective foods. UNICEF provides audio-visual material, transport for field workers, salaries of professors and five fellowships for counterpart personnel. FAO continues to provide technical advice.

UNICEF provided training and demonstration equipment for the agricultural extension demonstration zone, equipment for school canteens and gardens, transport, stipends. UNICEF is also providing canteen, garden and teaching equipment for 635 rural schools; vehicles; equipment for training centers for instructors and farmers, for extension centers and women's clubs; stipends, FAO is providing three experts and fellowships.

MADAGASCAR

