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A description and analysis of the health problems and programs in Haiti, a major recipient of international assistance. Its object is to document interventions in Haiti's health system which will contribute to its socio-economic development, and the effects of other developmental activities on health. Recommendations for specific action, however, are not part of the project. Chapters in this study cover: 1) Population and Health Status: vital statistics; 2) Conditioning Factors: Climate and Topography, culture and history, political situation, education and communication, economy, housing and sanitation; 3) Nutrition and Agriculture; 4) Organization of Public Health Services: financial resources, health infrastructure, health manpower, training of personnel; 5) National Health and Development Planning; 6) Health Assistance Offered by International Organizations, Bilateral Assistance, and Assistance Offered by Voluntary Agencies.

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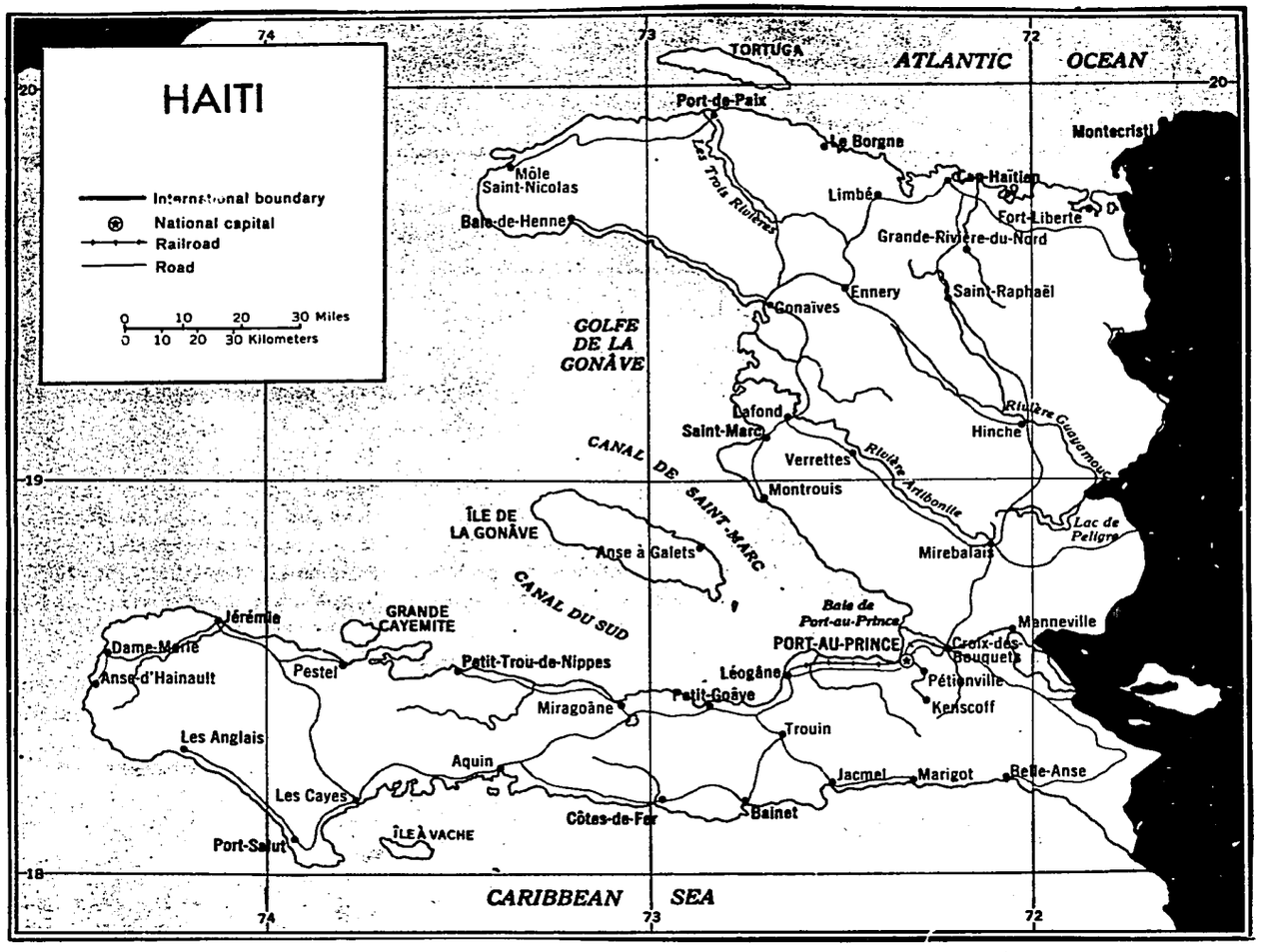
SYNCRISIS:

THE DYNAMICS OF HEALTH

An Analytic Series on the Interactions of Health and Socioeconomic Development

VI: HAITI (Revised)

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
OFFICE OF INTERNATIONAL HEALTH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SYNCRISIS

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U.S. Department of Health, Education, and Welfare
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PREFACE

Syncrisis studies describe and analyze health problems and programs in countries which are major recipients of international assistance. They are primarily aimed at an audience of international health consultants and program executives working in and for these countries. For this purpose Syncrisis is a concise, organized and up-to-date introduction to the health situation in the country, and an orientation to the most significant problems faced by the health system.

Syncrisis is intended to acquaint the generalist in development administration with (1) interventions in the health system of the country which will contribute to socioeconomic development, and (2) the effects of other developmental activities on health. To the specialist in comprehensive health planning, it will provide both a preliminary document for his work, and an indication of the sources of information available for health planning in that country. For the specialist in a specific aspect of health care, Syncrisis is intended to provide insight into the relationship of the subsystem with which he is concerned to the comprehensive health system and the larger society. For each of these professionals, Syncrisis is intended not as a final definitive document, but rather as a point of departure from which their own professional skills can be applied to develop activities that will benefit the country.

In addition to the principal target audience, which will probably include a few dozen persons for a specific country, it has been demonstrated that Syncrisis studies are useful to others. For this reason the studies are published and made available for sale to the public. Some consideration is given in the preparation of the documents to their possible use in health science education in the subject country, to education in international health, and by scholars concerned with more general aspects of the country or with closely related sectors.

Syncrisis studies form an unusual resource for the student of comparative health systems. They present, in a uniform format, parallel descriptions of health systems in countries with widely varying cultural, social, economic, and government systems. It is hoped that in the future this aspect of the Syncrisis series can be of increasing value.

Specifically, Syncrisis studies do not include recommendations for action. This is a function of health sector analyses, which, when appropriate, are the next step.

This volume was prepared from a draft by Arne Barkhuus, M.D., Dr P.H., on contract to the Office of International Health in cooperation with John A. Daly, Ph.D., Director of Health Sector Analysis Unit, Division of Program Analysis, Office of International Health.

LIST OF TABLES AND ILLUSTRATIONS

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Chapter I. POPULATION AND HEALTH STATUS

The published preliminary results of the census conducted in Haiti in 1971 showed the population of the country to have been 4,314,628. This is a much lower figure than had been estimated by the government for the years 1969 and 1970.

While some prior surveys had been carried out, the first real census in Haiti was taken in 1950. This census showed a total population of 3,097,000. The 1950 census was, however, by no means satisfactory. The census takers were largely untrained and inexperienced, and the population suspicious of the purpose of the census and therefore largely uncooperative. United Nations demographers have calculated that the census represented an underestimation of between eight and nine percent.

The 1971 census was designed according to commonly accepted demographic practice and executed under the supervision of competent professionals. According to a study by Professor Jeanne Newman of Johns Hopkins, examination of regional differentials in rates of growth computed from the census data, total, and by rural and urban status, reveals a reasonably consistent pattern: a 6 percent annual growth rate for the capital city, 4 percent for the urban residents, and 1 percent for rural residents. Except for the Port-au-Prince region, there was relatively little variation among the five traditional departments.

Nonetheless, Professor Newman is convinced that the 1971 census represents a 10 percent underestimate. She explains this underestimate as due to the difficulties in the enumeration of an illiterate, geographically remote, rural population with high rates of short-term mobility and unstable household composition. Evidence from several other sources of data fail to corroborate either the low rate of growth or the set of vital rates implied by that growth. Thus, field data from the Schweitzer Hospital yield higher birth rates, and field data collected by SNEM yield population counts for certain areas far in excess of census estimates. The growth of the urban and rural population from 1950 to 1971 is given by arrondissements in the accompanying tables.

The United Nations and the International Labor Office had, before the 1971 census, estimated a growth rate of 2 percent annually. The actual census figures for 1950 and 1971 indicate a population increase during the 21 years of 1,217,628, or 39 percent, giving an annual average increase of slightly less than the 2.07 of the latest health statistics.

The latest official birth rate is given as 37.17 per thousand. United Nations estimated that the birth rate declined from 45.5 to 43.9 between 1955 and 1970. The 37.17 is likely to be an underestimate.

The death rate is now given at 15.40. It was estimated by the United Nations to have declined from 25.5 to 19.7 between 1955 and 1970.

Life expectancy is now estimated at 50 years at birth, up from 45 in 1970. It is, however, difficult to say how real this improvement is. The same is true for infant mortality, which is now given at 138.8; while even in the late sixties, it was generally accepted as being around 180-190. The data for infant mortality are, except for certain specific areas, largely speculative. Median age of the population is estimated to be around 19 years. Age-sex specific census data for 1971 are shown in Table 1. The urban population represents, according to the 1971 census, 20.4 percent of the population. This is an increase of 8.2 percent since the 1950 census, indicating that the cities and towns have grown faster than the rural areas (see tables 2 and 3) during the last 21 years. This is particularly true in the case of Port-au-Prince, Gonaive, Port-de-Paix, Cayes, and Cap-Haitien.

The population density per square kilometer is 156 (1971), but measured in terms of arable land the average density exceeds 490 persons per square kilometer -- over two times as high as in the neighboring Dominican Republic, leaving in many cases less than an acre for a family farm.

During the last decade, there has been increased migration towards towns and urban centers. This has been largely due to the pressure on the land -- much less to actual opportunities for work in the urban areas. External migration has grown to more than 20,000 per year during the sixties, and has resulted in a relatively heavy loss of skilled and professional personnel.

VITAL STATISTICS

Mortality and Morbidity Statistics

A very real effort has been made by the Statistical Section of the Department of Public Health and Population to collect data on the different health activities of the country's health establishment during 1971-1973. In the preface to the most recent report from this section (June 1974), the lack of budgetary support and coordination of statistical activities is deplored, and it is firmly stated that there is an urgent need for supervision of all regional and district statistical activities. There is, at the central level, an almost complete lack of equipment for carrying out statistical analysis.

The coverage of the national vital statistics system is incomplete outside the facilities of the health system. For the long term, an effective national vital registration system remains the goal; meanwhile, joint Health Department-PAHO/WHO vital statistics survey areas are planned, the Les Cayes District being the first. Health statistics coverage is restricted to medical facilities and there are no plans to obtain population-based data on health problem prevalence.

In 1970 the total population was given as 4,867,190 (note the lower figure after the 1971 census) with 82,450 deaths or a mortality rate of 16.94. For the same year 4,551 deaths were given by cause (or groups of causes) and by age, utilizing the 8th revision of the International Classification of Diseases. Ill-defined symptoms, listed in Group F, accounted for 1,262 of those deaths.

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From the mortality data available, the ten most important disease groups or diseases are:

Avitaminosis and Nutritional Diseases	336 deaths
Pneumonia	175
Tetanus	116
Enteritis and Diarrhea	114
Tuberculosis	108
Cerebrovascular Diseases	103
Malignant Tumors	98
Chronic Rheumatic Heart Disease	59
Hypertension	45
Perinatal Deaths	32

Source: Compiled from a variety of national and international sources.

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These figures, taken from available hospital statistics, are as will be seen from the following discussion of individual diseases, not of much significance. They do, however, indicate the present state of mortality statistics.

Morbidity fitures on a national basis are not much better. Morbidity by cause and age are available as hospital discharges (the same source as above) for 1970 when a total of 11,899 patients were discharged. The ten most important causes of morbidity are listed on the following page. The same source also gives the morbidity from notifiable diseases by order of importance.

CAUSES OF MORBIDITY

Disease	Deaths
Enteritis	1,657
Accidents	396
Intestinal obstruction/hernia	349
Tuberculosis	218
Malignant tumors	217
Typhoid	215
Infectious hepatitis	183
Peptic ulcer	162
Cerebro-vascular disease	159
Benign tumors	139

MORBIDITY FROM NOTIFIABLE DISEASES

Disease	Number of Cases	Rate per Thousand
Intestinal helminthiasis	10,803	221.95
Malaria	10,661	219.00
Syphilis	2,310	47.46
Gonorrhea	2,250	46.22
Tuberculosis	1,966	40.39
Measles	1,189	24.42
Whooping cough	777	16.00
Amoebiasis	750	15.40
Tetanus	666	13.68
Typhoid	441	9.06
Infectious hepatitis	207	4.25
Chickenpox	164	3.36
Diptheria	39	.80
Bacillary dysentery	28	.57
Yaws	8	.16
Paratyphoid	--	--
Plague	--	--
Scarlet fever and strep. angina	--	--
Smallpox	--	--
German measles	--	--
Yellow fever	--	--
Other venereal diseases	--	--

It is of some interest to examine the findings of the tripartite project (Government of Haiti-Paho/WHO-UNICEF), which has been under way for over three years in Les Cayes Sanitary District. The Cayes team has been able to get regular reports from practically all institutions both in the town and in the rest of the district. During 1973 only 25 percent of possible monthly reports were missed and no institution reported less than 6 times a year. The Cayes district has therefore better epidemiological data than any other district in Haiti. A total of 7,759 patients were attended to at the district hospital, of which 4,252 or 54.8 percent were new cases. The total number of patients seen at all institutions in the district was 177,599, out of which 92,545 or 52 percent were new cases. Tetanus reporting illustrates what this project has meant for the improvement of data. The official figure for tetanus for Haiti in 1970 was 666 cases or 13.68 per 100,000 (see table on previous page). The official figure for Cayes district for the same year was 11 cases or 2.3 cases per 100,000. After the project had worked for a year with the improvement of data collection, the project figure for tetanus in Cayes for 1973 was 294 cases or 57.3 per 100,000.

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COMMUNICABLE DISEASES IN LES CAYES DISTRICT DURING 1973

Disease	District Hospital	Other Town*	Rural Areas	Total
Tetanus	46	58	190	294
Anthrax	36	16	335	387
Gastroenteritis	188	821	2,775	3,784
Malnutrition	101	1,288	7,493	8,781
Bronchopneumonia	204	633	4,048	4,885
Whooping cough	2	64	740	804
Diarrhea	2	1,174	7,858	9,034
Dysentery	2	146	322	468
Gonorrhea	1	238	2,239	2,478
Influenza	76	1,520	17,015	18,611
Infectious hepatitis	45	52	297	394
Meningitis	19	4	44	67
Malaria	65	485	1,997	2,487
Rheumatism	21	543	5,317	5,881
Measles		14	101	115
Typhoid	173	168	315	656
Tuberculosis	52	1,480	1,533	3,065
Chickenpox		11	67	78
Intestinal worms		3,310	18,229	21,539
TOTAL	1,033	12,039	70,736	83,808

* "other town" meaning from the other institutions in Les Cayes town.

Communicable Diseases

It is extremely difficult to estimate the prevalence of most communicable diseases in Haiti since it is certain that no more than half of the medical facilities (with a coverage calculated at less than 10 percent of the total population) report communicable disease cases attended; and, even such notification is subject to doubt. Any study of the available documentation with regard to this subject is therefore likely to yield a wide range of figures for the morbidity from almost any disease.

Malaria

Malaria is still, from a morbidity point of view, one of the most important diseases in Haiti. A separate section is devoted to this subject.

Tuberculosis

Tuberculosis is a major problem of public health in Haiti and a major killer of persons of all ages. Research and estimates have placed Haiti among the worst infected countries in the world. No statistical evidence is available which will permit exact statements with regard to the magnitude or the characteristics of the tuberculosis problem. Dr. Francois Dresse, PAHO/WHO Representative for Haiti, gave the national estimate as 1.8 percent of the population with active tuberculosis. It is estimated that in 1968, 45.2 percent of the patients consulting health centers in Port-au-Prince were suffering from active tuberculosis. Dr. Dresse estimated that 37,500-66,500 persons in Port-au-Prince were suffering from this disease. The rate for the Deschapelle Region (where information is likely to be more reliable than most other areas) is said to approach 3 percent. The Haitian military services has a rate of 1.2 percent. In a large survey in 1970, Dr. Turgot Cintellus, Director of Tuberculosis Control, Department of Health, found 3 percent with active TB. Dr. Vandiviere and Dr. Smith from the Haitian-American Tuberculosis Institute, found 2.6 percent with active tuberculosis in a survey of 25,000 in Jeremie.

It is obviously essential that this epidemiological situation should be taken into consideration when remoter areas of the country are opened up by extension of the road network. The tuberculosis problem is particularly serious under Haitian conditions of widespread malnutrition. The government tuberculosis organization is part of the Department of Health, but functions largely as a vertical organization closely collaborating with and supported by the Child Care Foundation and the Haitian Red Cross, which supplies most of the medicines and equipment.

The Child Care Foundation (now an inter-denominational organization) has been concerned with tuberculosis, especially in children, since its establishment in 1965. The Grace Children's Hospital for Tuberculosis in Delmas, Port-au-Prince, was built in 1967 and has now 200 beds with a full-time pediatrician and a tuberculosis expert attending regularly. It receives children from all over Haiti, but does not have facilities for surgical procedures. Children in need of such are sent to the Albert Schweitzer Hospital in Deschapelle. Although the Foundation has provided vital resources on an inpatient basis to critically ill tuberculosis children, it was long realized that it was only through effective outpatient diagnosis and treatment that anything could be done to control TB on a larger scale. Shortly after the opening of the hospital, arrangements were therefore initiated to allow the Child Care Foundation to import and distribute drugs for treating tuberculosis on an outpatient basis. In 1969 the Government of Haiti provided the Grace Children's Hospital with a franchise for importing TB drugs duty-free and with the responsibility and authorization for expanding tuberculosis control.

As a major support in implementing the drug distribution program, a United Methodist group from Marion, Indiana and others have established a revolving fund used in purchasing drugs for subsequent sale at cost to qualified organizations in Haiti. Tuberculosis drugs are currently

distributed through about 40 dispensing centers; in addition, about 20 clinics and hospitals are cooperating with the Child Care Foundation in this effort. It is estimated that over 3,500 persons are currently under treatment for TB, with drugs supplied through the drug distribution program.

The Child Care Foundation has now, in agreement with the government, decided not to expand the Grace Hospital, but instead to go in for a program to attempt to control tuberculosis on a national basis:

1. Developing diagnostic and treatment services throughout Haiti by the establishment of a select number of strategically located laboratories equipped with microscopic examination facilities for processing sputum.

2. Working with and through existing medical resources and groups in Haiti, such as government clinics, hospitals, schools and missionary groups, in order to reach the maximum number of tuberculosis victims; such places to be instructed in the gathering of sputum and, as appropriate, in the administration of tuberculosis drugs.

3. Making TB drugs available at cost to groups referred to above (in effect continuing the drug program at the moment operative).

4. Centralizing medical and administrative control of diagnostic laboratories at Grace Children's Hospital.

5. Parallel to the diagnostic and treatment work directed at victims of active tuberculosis, cooperate with the Brother's Brother Foundation in support of a program to innoculate the children of Haiti with BCG.

6. Implementing the program with the cooperation of the Haitian government and interested groups in Haiti, encouraging a self-help approach open to public, private, and religious organizations interested in controlling tuberculosis.

Tetanus

Tetanus has a high correlation with poor sanitation and inadequate medical services. Tetanus neonatorum has, under the best of circumstances, a very high mortality rate. Even with early diagnosis, the treatment is prolonged and expensive and requires highly skilled personnel. There is evidence in Haiti that tetanus neonatorum, i.e., the infection of the umbilical stump, is the most important cause of infant mortality. This has very likely been the case for at least 200 years. French physicians of the 18th century believed that at least one-third of the children born of Haitian mothers of African origin died of "jaw disease."

Since 1956 the Albert Schweitzer Hospital in Deschapelle has provided clinical services for a large rural area in the Artibonite Valley in central Haiti. Tetanus neonatorum has been a regular cause of admission to the hospital, which sees about 6,000 outpatients per month. When the hospital opened, the frequency of tetanus neonatorum in the area served was estimated to be about 14 percent of live births. A community health program was begun in 1967 by the hospital, in collaboration with the Harvard School of Public Health. As part of this program, 23 villages with a total population of 9,000 were studied through annual census and collection of vital statistics. The table on the following page indicates the situation with regard to tetanus neonatorum.

Year of Birth	Births	Deaths No.	Deaths %	Deaths-Tetanus No.	Deaths-Tetanus %	Other Deaths Number	Other Deaths Percent
Before 1940	371	180	49	91	25	89	24
1940-44	630	285	45	171	27	114	18
1945-49	816	300	37	167	20	133	16
1950-54	1,072	423	40	226	21	197	18
1955-59	1,445	394	27	196	14	198	14
1960-64	1,634	329	20	184	11	145	9
1965	338	61	18	32	9	29	9
1966	331	42	13	19	6	23	7
1967	281	27	10	12	4	15	5
1968	330	15	5	1	0.3	14	4
1969	305	14	5	0	0	14	5

Source: Bergren, Warren L. and Gretchen M.,"Changing Incidence of Fatal Tetanus of the Newborn," American Journal of Tropical Medicine and Hygiene, 20:491-494, May 1971.

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If the early Deschapelle figures are projected to the rest of the country, where so far little has been done to prevent tetanus neonatorum, a total of 10,886 deaths annually may be expected in children under one year. Births in rural areas are attended by "matrones," women without any formal training. Certain local customs such as the application of soil to the cord, are extremely dangerous. In 1969, 15,396 persons were vaccinated with two doses of toxoid, and plans for a large-scale vaccination program are under study.

Smallpox

There has been no smallpox in the country since 1921. A smallpox vaccination program was started in 1962 on a national scale, based on the facilities of the yaws eradication program. Up till 1970, about 60-70 percent of the population had been vaccinated. WHO has recommended in 1970 the continuation of the vaccination program in order to obtain and maintain safe levels of protection of the population. There has recently been some difference of opinion with regard to the necessity of continuing the smallpox vaccination program, which, however, would seem to be indicated in view of the present inadequate epidemiological surveillance and the lack of facilities for handling an emergency situation. A combination of smallpox vaccination with simultaneous innoculation for more prevalent diseases might be the most efficient procedure.

Diptheria and Whooping Cough

It would seem that diptheria is not a serious problem in Haiti. In a period of 14 years (1955-68), only 520 cases were registered with a total of 15 deaths. Even taking the poor coverage and the lack of diagnostic facilities into consideration, it would seem that diptheria is not a priority problem. One indication of its relative rarity is the fact that it is not mentioned in the 1973 report for Cayes district.

For the period 1955-69, 30,851 cases of whooping cough with 23 deaths were registered. However, if the Cayes district figures of 804 cases in 1973 is to be taken as typical for a population of 500,000, the whole country would have had 112,560 cases after 14 years, about four times the registered figure. Once more, the available data is not to be taken too seriously. Vaccination against whooping cough has not reached any significant level except in Cayes district, where 32,522 complete vaccinations with DPT (diptheria, whooping cough, tetanus) have been accomplished in children under five years of age.

Poliomyelitis

Practically no data are available with regard to poliomyelitis. As in most developing countries, it may be expected that antibodies to all three types may be found in most children by the time they reach 4 years of age. Since most of these children become infected early, the chance of clinical manifestation is comparatively small. Environmental sanitation in most of Haiti, including the capital, is so lacking that this mechanism may be thought to operate. Three cases were notified in 1967, but there have supposedly been two epidemics over the last decade, one with 150 and another with 350 paralytic cases. There is also said to have been a serological investigation of two areas which both showed lack of immunity in the population. Large-scale efforts to combat poliomyelitis have been carried out in the neighboring Dominican Republic. More investigation seems called for before any decision on a possible vaccination campaign can be taken. With improvement in sanitation this will no doubt become necessary.

Measles

No reliable data are available, but measles does not seem to be a major problem, notwithstanding the serious situation with regard to malnutrition. The Cayes district shows no mortality from measles in 1973. In 1970 there were 1,189 notified cases of measles, which seem to have been without serious complications.

Enteric Infections

There is no doubt that enteric infections are highly important from both a medical and a public health point of view. Reliable laboratory facilities are lacking outside the capital, and even in Port-au-Prince they are far from satisfactory. Typhoid and paratyphoid are no doubt serious problems, with typhoid endemic in a number of urban areas. The national figure for typhoid cases seen in government institutions during 1973 was 730, with 56 deaths. There were 656 cases found in Cayes district in 1973. Once more, if we take Cayes to be typical for the country, this would mean over 6,000 cases of typhoid for the country annually. In 1968 there was a water-borne typhoid epidemic in Port-au-Prince with 1,548 cases and 58 deaths.

The health Department has undertaken a program of typhoid-paratyphoid vaccination of limited urban coverage. In 1969, 27,127 vaccinations were carried out. The typhoid problem is largely one of urban sanitation, which again is dependent on financial possibilities.

Gastro-enteritis (bacillary dysentery) constitutes without a doubt one of the most serious problems, although insufficient data are available to appreciate the size of the problem on a national scale. Little information is available with regard to the actual etiology, but as in most developing countries the etiological factors are likely to fall into three broad groups -- infective, parenteral and nutritional. As elsewhere in the Americas the shigella family is likely to play a major role, although there is reason to believe that Ench. coli is an important factor in infantile diarrhea. In the parenteral group other infections such as malaria play an important part, while in the nutritional group the obvious relationship of malnutrition to the incidence and severity has been established by Gordon and Scrimshaw. Thus, the very high rates of kwashiorkor in Haiti may follow or be followed by high rates of diarrhea.

Based on consultation records, infant diarrheas are among the most serious health hazards facing the country. During 1963-1964, 47.9 percent of all admissions to the pediatric services of the University Hospital in Port-au-Prince were for gastroenteritis, as were 40.5 percent of the deaths registered in the service. In 1969, 18 percent of total discharges from the University Hospital and 54.4 percent of the discharges from the pediatric service were cases of gastroenteritis. The number of cases in the interior is difficult to estimate due to the insufficient coverage and the fact that hospital beds are not utilized effectively, partly due to lacking transport facilities. Even more importantly, the lack of medical supplies and materials leaves many victims of gastrointestinal diseases without needed care. Only in very few places outside the three or four larger towns is it possible to provide early rehydration, the necessary chemotherapy, and a quick resumption of adequate protein-calorie intake after the cessation of the diarrhea. In the rural areas where most of the cases will be found, there are presently 0.2 physicians per 10,000 inhabitants, 0.4 nurses, and 0.7 beds per thousand. In Cayes district 188 cases of gastroenteritis were treated in the District Hospital in 1973 and a total of 3,784 cases were seen in the district as a whole. It is not possible to draw valid conclusions from these figures, since even in Cayes there is no reason to believe that more than a fraction of these cases are seen.

At the end of the last decade, enteric infections constituted one of the three primary causes of death in children under one year of age in the region of the Americas and the Caribbean. In eleven countries in this region they accounted for over 15 percent of all deaths in the population under five years of age, with rates ranging from 12 to 33.9 percent. It may be worth noting that the corresponding figures for U.S. and Canada were 1.4 and 1.5, respectively.

In the long term, environmental sanitation and socio-economic development are all important. It has been shown that even apart from a bacteriologically safe water supply, the ready availability of water for ablution and personal hygiene is important in the control of diarrheal diseases. In Haiti it is estimated that only 12.5 percent of the population has access to piped water of more or less safety. Direct supply is said to be available to 30 percent of the population in Port-au-Prince, but this water cannot be considered safe. supplies are also available to 10.6 percent in twelve towns covering 264,236 persons. In the rural areas where 80 percent of the population lives, the coverage is insignificant.

Only in the capital is there a system of drainage, largely dealing with stormwater, but with insufficient capacity even for this purpose. Food inspection is undertaken on a limited scale in Port-au-Prince and one or two of the larger towns.

As far as can be ascertained from information available, amoebic dysentery is largely confined to an area in the northern part of Haiti. A figure of 2,271 cases was given for 1971.

Influenza and Bronchopneumonia

The figures given for acute respiratory disease in governmental institutions in 1973 were as follows:

	Cases	Deaths
Influenza	129	2
Non-viral pneumonia	535	236
Bronchitis, emphysema, asthma	206	14

The high incidence of death from pneumonia most likely reflects the fact that many patients in the hospitals die from terminal pneumonia, with this cause appearing on the death certificate. It is unlikely that it refers exclusively to the persons who initially sought care for pneumonia.

Once more, the Cayes district statistics are more revealing. For 1973 a total of 18,611 cases of influenza occurred; 76 in the District Hospital, 1,520 in the other institutions in the town, including outpatient clinics and 17,015 in the rural areas. The figures for bronchopneumonia were: District Hospital 204, other institutions in the town 633, and rural areas 4,048, giving a total of 4,885 cases.

Syphilis and Other Venereal Diseases

According to available information, there has been a decrease in syphilis since 1935 when 7,283 cases were diagnosed and treated. In 1969 there were 1,898 cases diagnosed. The recently published health statistics (June 1974) give no information on venereal diseases, but there is every reason to expect that these diseases constitute an important problem, at least in the urban areas. It has been suggested that the disappearance of yaws may have had an influence on the number of diagnosed cases of syphilis, yaws having often been mistaken for syphilis. This would not seem reasonable at a time when yaws must have been a well-known entity to most physicians practicing in Haiti.

It is known that venereal diseases are reaching epidemic proportions in the neighboring Dominican Republic, where over the last five years the incidence rates for syphilis and gonorrhea have been consistently and significantly higher than any other communicable disease. Diagnosis would have to be largely concentrated in outpatient clinics and MCH centers which are at the moment poorly equipped for this task, particularly lacking the necessary laboratory support, and the possibility of following up contacts.

The Cayes district lists 2,478 cases of gonorrhea for 1973, all but 239 in the rural areas. No figures are given for syphilis.

While it is true that syphilis and gonorrhea generally declined following their resurgence from the beginning of World War II up to 1956-58, it is known that there was a general increase in venereal disease in the sixties in the Region of the Americas and the Caribbean. With rapid urbanization and its accompanying pressures, and with increased unemployment and poor distribution of services, an increase in all sexually transmitted diseases must be expected. Epidemiological investigation, particularly contact tracing, will be needed before the size of the problem can be estimated.

Yaws

Yaws was once one of the most important endemic diseases in Haiti. In 1949 the government of Haiti requested the collaboration of the Pan American Sanitary Bureau in planning a program for the complete, final solution to the yaws problem. The approach to yaws eradication used in Haiti has demonstrated that yaws eradication is feasible in a short period of time at a low per capita cost. The approach was on a total population rather than on an individual basis, with as nearly as possible, simultaneous single injections of penicillin to every infected person in each district. Since infected persons cannot be recognized during the incubation period, all contacts were treated, with all persons resident in infected areas being classified as contacts. In five years yaws was virtually eliminated from Haiti. Today less than 100 cases remain in remote areas. It is the intention to find and treat these cases.

The economic benefits to the Haitian economy resulting from the eradication of yaws, a disease that attacked a large percentage of the rural population of this predominantly agricultural country, handicapping and incapacitating many, are incalculable. This campaign, incidentally, led to the Haitian government's request for a transformation of its malaria control program into an eradication program.

Leprosy

The exact situation with regard to leprosy in Haiti is not known. There are at the moment approximately 300 cases of diagnosed leprosy, but it is likely that there will be an increase as physicians are taught to recognize the disease. Only a small proportion of these cases, mostly in Port-au-Prince, are under control. Patients tend to abandon treatment when they get better clinically. The Dominican Republic, with a slightly smaller population, has about 1,781 cases registered, and there is little reason to doubt that a case finding program would show comparable figures for Haiti.

Rabies

Rabies is endemic in Port-au-Prince, with 29 known human cases in the country over the last 15 years. There is currently a program for eliminating stray dogs in Port-au-Prince. The University Hospital and the Health Department handle vaccination and in 1969 46 persons were vaccinated after having been bitten.

Yellow Fever and other Virus Diseases

There is no yellow fever in Haiti. Neither Haiti nor the Dominican Republic have initiated a campaign against Aedes aegypti despite encouragement from PAHO/WHO. Dengue, however, is frequent both at Port-au-Prince and in the vicinity of Cap Haitien. There is no reason to doubt that with the large amount of aedes and culicines, a wide variety of arbovirus and respiratory virus diseases are common. Diseases like Venezuelan encephalitis may be expected to occur. The growing trend toward urbanization makes for increased human contact with rodents, thus favoring occurrence of rodent-borne diseases. There are no diagnostic facilities in Haiti for virus diseases.

Infectious Hepatitis

Infectious hepatitis is fairly common. The official institutional statistics for 1973 gave 208 cases with 11 deaths. Cayes district showed 394 cases for the same period.

Helminthic Diseases

Ascariasis (roundworm infection) is prevalent in rural areas, particularly during the mango season, where the heavy infestation in already malnourished infants and children is a serious problem. Hookworm is widespread in the rural areas and is an important contributing cause of anemia. Filariasis is not mentioned in the health statistics, but it is known that there is a certain amount of infection with nocturnal microfilaria transmitted by Culex fatigans. There are descriptions of elefantiasis in the older literature. It is surprising that there is no schistosomiasis, although vectors are available and the disease occurs in the neighboring Dominican Republic.

Anthrax

Anthrax is widespread in cattle and goats. In 1973 there were 56 cases admitted to medical institutions in Haiti according to official statistics. The export of skins (particularly goat skins) to the U.S. has recently been prohibited, and the problem is presently being examined by the government with expert U.S. assistance. Once more the Les Cayes project shows much higher figures than the official statistics -- a total of 387 clinical cases in 1973.

Non-communicable and Chronic Diseases

The general problems of non-communicable diseases are of course present in Haiti, and with future advances in the control of communicable diseases they will become more and more important.

According to the surgical department of the Albert Schweitzer Hospital, certain peculiarities are, however, seen in the nosology of Haiti. The Albert Schweitzer Hospital performs an

average of 2,500 operations yearly with 13,800 visits to the surgical clinic. Based on this experience it would seem that there is considerably more cancer of the stomach in Haiti than is found in the U.S., while polyposis and cancer of the colon is fairly infrequent. Far advanced cases of cancer of the cervix (a good index of the general inadequacy of the health infrastructure) is a common finding, as is prostatic cancer and cancer of the penis. The hospital has seen no cases of Burkitt tumor or Hodgkin's disease, and leukemia is found to be rare. Peptic ulcers are very common, but perforations are rarely seen. In 1972 the hospital had six cases of perforated ulcer of the ileum due to typhoid fever. Pulmonary infection with lung abcess and emphysems is seen frequently, as is osteomyelitis in children, combined with sickle-cell anemia. Ectopic pregnancies and pelvic inflammation are fairly common. Urethral strictures as a sequela of gonorrhea are also common.

It can be seen from studies of all deaths from cardiovascular diseases, diabetes, alcoholism, mental disorders, etc., that the importance of these diseases is increasing with urbanization. However, it should once more be emphasized that the major problem in Haiti is to ensure that the more than 80 percent of the population that live in rural areas have an opportunity to participate in what the health service has to offer. The greatest priority will therefore for a long time to come, have to be with rural problems, which are overwhelmingly in the area of communicable diseases.

Malaria Eradication/Control (SNEM)

The "Service National d'Eradication de la Malaria" was originally set up under an ARRETE of August 20, 1958 signed by the President of the Republic (Le Moniteur Lundi 8 Septembre,1958). At this time SNEM was organized as an integral part of the Ministry of Health, but with full operational autonomy. It was under the technical control of a Malaria Committee set up under the same ARRETE. The PAHO medical adviser was made director of this early SNEM.

The malaria eradication campaign was begun in 1958 but had to be discontinued in 1960 for economic reasons. In November 1960 the government instituted a malaria control campaign (CCM) which today would be considered a pre-eradication program. In February 1961 a "Memorandum of Understanding for the Organization and Administration of a Malaria Eradication Campaign in the Republic of Haiti" was signed by the Government of Haiti, the International Cooperation Administration, PAHO, and UNICEF. In 1963 USAID took over from the earlier U.S. Operational Mission to Haiti (USCOM). The malaria program has had a number of technical problems which will be briefly outlined.

The attack stage of malaria eradication was started in 1962 with weekly spraying of the houses in the malarious areas. The necessary data had been collected in 1961 during the preparatory phase and it was known that:

(a) The malarious area covered 19,100 square kilometers with 3,851,342 inhabitants in 952,000 houses.

(b) Anopheles albimanus was the only vector incriminated in transmission and was susceptible to DDT.

(c) Transmission was taking place from coastal level to an altitude of 500 meters above which there was only occasionally transmission.

Intradomicillary spraying reduced the positives from 7 percent to 1.5 percent by the end of 1962, and it was generally considered that the solution to the malaria problem had been found. However, notwithstanding continuation of spraying, the positives remained at a level between 1 and 2 percent. Intermission between sprayings was reduced from 6 to 3 months with no better results.

In October 1963 Hurricane Flora destroyed a large number of houses in the Petit Goave area and caused considerable flooding, with consequent increase in anopheline density. This situation was further aggravated in 1964 by hurricane Inez. It now became necessary to find another way of attacking the problem, and since few houses were left standing and an enthomological survey had suggested extradomicillary transmission, it was decided by the Evaluation Committee in February 1965 to go in for massive drug distribution. This campaign was begun in May 1965 and included 1,200,000 persons throughout the malarious areas of the country. The results were the best ever obtained by SNEM. Between 1965 and 1968 the positives ranged between 0.6 and 0.2 percent with the result that eradication was thought to be practically within view.

It was then considered that chemotherapy was the ideal solution; however, the euphoria did not last. It was soon found that there was not sufficient financial means to continue the drug campaign at the necessary level, nor after a while, was the population willing to continue with taking drugs regularly. It was consequently realized that malaria eradication could not be achieved solely through chemotherapy. Once more DDT became the main weapon, this time reinforced by larvicide, drainage, and ultra-low-volume malathion (ULV). Once more it was proved that DDT alone could not effect eradication in Haiti. Since 1969 (see table 5 and figure 8) the positives have shown considerable variation, relating to periods of hurricanes and excessive flooding. Thus, in November 1972, a high of 14.5 percent was reached following flooding of the southern peninsula in May of that year.

SNEM's activities while not accomplishing the hoped-for eradication, have by no means been ineffective: malaria is no longer a major cause of death in Haiti. In May 1973 the Evaluation Committee found that malaria, instead of existing in practically all areas below 500 meters, had become more focalized in certain precise areas, namely in about 52 rural sections out of 560 in the country. Details of this distribution will be given below.

In none of these places where malaria has remained have the anti-malarial measures employed been found to be effective. It is unfortunately not known at this time why the response has been so unsatisfactory to the different approaches that have been utilized in these areas. The problem has been discussed in successive Evaluation Committees, but lacking sufficient basic malariological and particularly enthomological data, no agreement on the cause or causes has been obtained.

It may be said that today we are dealing with two different types of malaria situations in Haiti:

(1) A zone with low transmission consisting of approximately 450,000 houses with about 1,260,000 inhabitants. This is not a geographical contiguous zone, but principally takes in areas over 300 meters altitude. Here passive evaluation is carried out with radical treatment of cases.

(2) An area where attack measures are being carried out actively. About 850,000 houses with a population of 2,400,000. This area is mostly constituted by the flat coastal parts of the country below 300 meters. Transmission is found to be particularly high in three areas:

   (a) Petit Goave - Miragoam: This area has about 17,800 houses with 46,000 inhabitants. Malaria transmission is particularly active here. Difficulties are enhanced by the Miragoane Swamp and a number of small rivers plus extensive water masses during the rains. There is a high vector density, reaching 80 anophelines per home per hour.

(b) Aguin: This area comprises 14,500 houses with 38,500 inhabitants. This is a dry area crossed by a river with large water masses during rains. During the period of high transmission it is one of the places with the highest positive percentage of malaria. Thus in 1970 of 18,092 slides examined, 1,814 were found positive constituting 10.03 percent.

(c) Jean Rabel: This area comprises 10,800 houses with 28,000 inhabitants. It is a difficult area with regard to communication and accessibility. There are many small rivulets and a small swamp, which has a great density of vectors during the rainy season, with corresponding high rates of positives.

There can be little doubt that it will be indispensable to control these hyper-endemic foci if malaria is to be controlled/eradicated. This problem is under active investigation at the moment, as is the role SNEM should play in the future of Haiti's health service.

Chapter 2. CONDITIONING FACTORS

CLIMATE AND TOPOGRAPHY

Haiti and the Dominican Republic share the island of Hispaniola, which lies between Cuba and Puerto Rico. Haiti, approximately the size of Maryland, is three-fourths mountainous and only about one-third of the country's 10,700 square miles can be cultivated. Population (with the highest percentage of rural population in the Western Hemisphere) is concentrated in the fertile plains and some mountainous areas. Copper and bauxite, in limited deposits, are the only minerals mined. Petroleum must be imported. The use of wood for fuel contributes to soil erosion and to the depletion of forests (10 percent of the land), which include mahogany and coffee trees. The feasibility of mining lignite deposits for fuel is being considered.

Haiti's climate is hot and humid year-round with slightly lower temperatures in the highlands. The rainy season extends from April through December with tropical hurricanes generally occurring about once a year, in June or October. Every two or three years these storms cause heavy destruction of food crops, coffee trees, and houses (particularly on the southern peninsula). The northwest is subject to frequent droughts, which have caused serious famine. Rainfall varies and some semi-arid plateaus require irrigation; both flood control and irrigation are important in the fertile plains. The climate is favorable to the breeding of disease vectors, fleas, flies, and mosquitoes; drainage ditches provide breeding places.

Water is generally in abundant supply except for some shortages during the dry season. The one river large enough for transportation, the Artibonite, is the site of Haiti's first hydroelectric plant. Numerous small, rushing streams, rugged mountains and occasional landslides, sometimes triggered by mild earthquakes, create barriers to transportation. Streams often overflow their banks, damaging roads and limiting their use.

CULTURE AND HISTORY

Haiti is the least urbanized of the Latin American Republics. In 1971 the urban population, defined as those living in areas with 2,000 or more inhabitants, represented only about 18 percent of the total. Most of the rural population lives in settlements surrounded by fields, much as in West Africa. Many of the older communities consist of a number of *lakous*, or land on which several generations of a large family live.

The most salient characteristic of the Haitian society is the dichotomy between a small, literate, urban, French-speaking, principally mulatto elite and an isolated, illiterate, Vodoun-practicing, Negro rural peasantry, who speak only Creole. Both groups were adversely affected by the economic decline and stagnation of what used to be a rich French colony and the virtual isolation of the country for the last century and a half.

The original Indian inhabitants of the island died out rapidly under the forced labor practices of the Spaniards vainly searching for gold. The Spanish yielded Haiti to French pirates, and after a time French settlers began to exploit the land's only economic potential -- agriculture -- using slave labor imported from many tribes of West Africa.

During the seventeenth and eighteenth centuries, about 27,500 mulatto offspring of the French settlers became landowning, educated, and themselves owners of slaves. To achieve full freedom they finally united with some 450,000 Negroes to overthrow the French and declared the independence of Haiti in 1804. The Caucasians who had not already fled were killed, resulting in the loss of the economic, political and technological organization which had run the country. There were attempts by the new leaders to restore the productivity of the land by organizing the former slaves. The freedmen, however, valued liberty above all and wanted only to derive a personal income from a generous plot of fertile land. When most of the larger plantations became unprofitable, the owners, members of the elite, abandoned them and went to live in the towns.

The upper class, which makes up less than 2 percent of the population, continues to live in towns and cities. Social status is maintained through legal marriage within the class, support of French traditions in education, religion, and language, and a disdain for all manual labor; a premium is placed on family background. The average upper-class income is probably about $10,000, a great wealth by Haitian standards. The elite manage to send their children to the best local private schools and usually abroad for higher education. By the mid-sixties, this group had lost their dominance of government positions to members of the middle class. Some of the upper class lost their lives or businesses, or were forced into exile. The upper classes continue, however, to dominate the private sector.

The black middle class, some 4 percent of the population, emerged in the 1940's as a result of expanding urban educational opportunities beginning in the early part of the twentieth century. They are led by political leaders who have, in turn, made way for black bureaucrats. Children of the middle class are finishing secondary school and entering the university in increasing numbers. Most of the middle class enter legal marriages and it is possible, though rare, for a prominent middle-class man to marry a woman of the upper class. Family incomes typically range from $500 to $2,000 a year and are often overspent, resulting in debt.

The lower class comprises a small urban element and the rural peasantry. The urban lower class left the countryside in search of jobs or to escape starvation in times of famine. Those who actually find employment take such occupations as truck and taxi drivers, market women, domestic servants, and lottery ticket vendors. Most of the urban lower class are unemployed or underemployed, but evidently acquire a certain sophistication from their urban experience. Some of the most ambitious are able to ascend to the middle class.

Only a very few (5 percent) of the rural population achieve even a moderately comfortable standard of living. Most of the rural peasantry farm small plots of land, which they own or on which they have squatter's rights. They produce a small surplus which is sold by the women once or twice a week in markets many miles away. Farming is always the main occupation even when other work is also performed.

Marriage has never been a tradition among the peasantry since such unions were discouraged by the slaveowners. Common-law unions (placage) are socially acceptable and often stable. Polygamous unions, still common, complicate patterns of inheritance. As land grows more scarce, legal marriage or a single common-law union is becoming more popular.

Certain Haitian values generally held by all classes are important in the consideration of the dynamics of Haitian culture. "Holding" land is a measure of status apart from the economic productivity of the land. A man's worth is roughly determined by the amount of land he owns or controls. (Land tenure, including the definition of public and private domain, is confused.) Accumulated savings are often reinvested in land, although other investments would be more profitable. In contrast to the value placed on land is the low regard in which business is held. Only in the upper classes are business activities not considered somewhat degrading. Selling produce in the market-place is relegated to women and those activities, however profitable, have lower status than those of a domestic servant. The middle-class Negro prefers a profession or government job to a business occupation.

Another important value is that of power. The public sector has traditionally been the area for power struggles and, like the acquisition of land, power is sought for its own sake

rather than to improve the economic position of the individual or the country. In the public sector, the Haitian can wield power by collecting taxes, manupulating land titles, and controlling the proceeds of land by setting fixed prices on some crops.

The Haitian learns unquestioned respect for authority during childhood. Obedience to parents and other adults is severely enforced by physical punishment. The Haitian child assumes adult duties very early. He learns to submit totally and to repress aggressive responses. He never gets to test his strength and impact on others and begins to doubt his own ability for independent action. Fathers have absolute authority and demand obedience even from grown children; this dominance is reinforced by the shortage of land and the child's dependence on inheritance.

Cooperative effort is not common with the exception of the "combite," in which various farmers come together to accomplish a farming chore beyond the capacity of the individual farmer. A feast at the end of the day serves as recompense. Other efforts at cooperation, such as the community council, have had to contend with Haitian values of power and hierarchy, and with anxiety in the face of decision making. Several sources indicate that the peasants respond better in a more authoritarian group approach. So far, the rural population has been unable to organize to defend its interests, except under the most extreme circumstances. The most effective action of the individual farmer is to resist the pressure of the government to produce export crops, which yield him a small return compared to the percentage which goes to the government and to the state-licensed middlemen.

A common spiritual denominator among Haitians is found in the mysticism of Vodoun, a polytheistic cult of African origin. Most Haitians are influenced by Vodoun even though they may profess disbelief or adherence to Christianity. Many practice both Vodoun and Catholicism without any sense of contradiction. In Vodoun, gods are constantly present in men's activities and may "possess" and leave human bodies. The loa or spirit may take possession in a dream or may appear in full consciousness as a feeling of insecurity or awareness of supernatural beings. The loa can be detrimental as well as beneficial to the one it possesses, and it must be placated by various ceremonies generally understood by most Haitians. When assistance is needed in determining which deities have been offended and what measures should be taken, particularly during sickness, a houngan or mambo (priest or priestess) is called in. Often the houngan or bocor (diviner) gives sound advice to allay anxiety or effective medicine to cure illness. In many cases, however, a counter-spell is put on an enemy, and many practitioners tend to emphasize conflict situations rather than to reduce animosities and fears. A Haitian psychiatrist argues that possession states of Vodoun are outlets for otherwise inexpressible aggressiveness.

On the positive side, Vodoun group ceremonies and similar non-sacred celebrations of dance and song combine with a rich array of folk maxims to lend some cohesiveness and structure to rural peasant life. Vodoun continues to display great vitality, partly because it is associated with the spirit and genius of the black people. It is remembered that triumph over slavery was the work of black conspirators who enlisted the aid of their African deities. While the Christian God ("Bon Dieu" as he has been adopted in Haiti) is a rather passive observer of men's affairs, including slavery, the African deities can be dealt with on a human level.

According to Vodoun beliefs, illness is caused by supernatural forces. For example, filariasis is believed to result from stepping on strong magic powder; yaws, from the anger of a loa. Although the basic ignorance and superstition of the peasantry are obstacles to the improvement of health, the rural population does not fear modern medicine as it once did and considers it a form of magic.

POLITICAL SITUATION

Haiti has had several forms of government and 14 major constitutions since 1804. In fact, all governments have been dictatorships which generally fell before a stronger leader and power coalition. Only 6 of the 34 chief executives have completed their terms in office. Widespread corruption, violence and plotting, and raiding of the public treasury have been characteristic of Haitian politics. Although a few of the national leaders have tried to introduce programs to benefit the rural masses, politicians have generally found it to their advantage to keep the peasantry isolated, and thus powerless. The people have played into the hands of these leaders by being apathetic towards political matters. There is no apparent tide of rising expectations in Haiti. The government program tends to maintain apathy by not permitting the election of the President by direct suffrage (except in 1957), by supporting the Code Rural (1845), instituting military rule in rural areas, by allowing rural isolation to continue through inadequate programs for literacy, education, public health, transportation, communication, and agricultural and economic development.

The U.S. Marine Occupation (1915-1934) was prompted by the serious economic and political instability in Haiti and the threat of German intervention. The Marines met little resistance, established order by placing the most technically competent Haitians, the mulattoes, in power, and devoted attention to practical matters such as roads, communications, schools, etc. Resentment against foreign domination was strongest among the lower classes and created the necessary climate for the appreciation by Haitians of the strong African elements in their culture. This new appreciation of Creole rather than French-inspired culture encouraged the emergence of a black middle class with growing political power. In 1946 President Estimé purged the mulattoes from the government and established Negroes in their place. Negroes have dominated the public sector, with few exceptions, since that time.

The structure of the government is highly centralized; the executive branch dominates the legislative and judicial branches in theory and in practice. Most policy is made by Presidential decree. The President has control over members of the executive and judicial branches, all of whom are appointed, and over local government officials who are not elected. The 1964 Constitution proclaims various guarantees of human rights; these have been put aside when politically expedient.

Regional governments are a function of the national government. Although the last two constitutions divided the country into 9 departments, the original five departments continue to function as the major administrative divisions. Information on the respective jurisdictions of the military and civilian officials in rural areas is not available. Subdivisions of the departments include 27 arrondissements, 117 communes, quartiers (wards), and rural sections. The prefet is the civil administrative official at the arrondissement level and is the direct representative of the President. The commune, the basic unit of local government, is supposed to have some degree of autonomy through elected communal councils. In practice, no such elections have been held. Although taxes go directly to the national treasury, communes do disburse a limited amount of funds. The quartiers and rural sections have no autonomy and are of minor importance.

EDUCATION AND COMMUNICATION

After independence in 1804, the educated included only a small number of free mulattos and a few former slaves. The new mulatto elite, concerned primarily with maintaining their position, showed little interest in educating the masses. A century and a half later literacy has remained basically a privilege of the favored class. About 85 percent of the population is illiterate, speaks only Creole, and lives in rural areas at a subsistence level. The literate population speak French as well as Creole, live in urban areas, and are upper- and middle-class,

and a few partially literate members of the lower class. Even after the political ascendancy of the Negroes in 1946, government efforts were not focused on upward mobility for the masses as had been expected, but were concentrated in the urban areas where the elite live. Most rural education has been largely provided by foreign (U.N. and U.S.) and religious organizations, except for sporadic literacy drives by the government. Some observers cite government fear of an educated electorate as a major obstacle to the expansion of educational opportunity.

As in other institutions in Haiti, the written laws are ambitious but cannot be implemented with available resources. While the Constitution provides for free and compulsory primary education, and free high school and higher education, schools and teachers are simply not available. In 1968, only about 23 percent of those of primary school age were in school and the annual rate of increase in enrollment is less than the rate of population growth for that age group. The dropout rate is approximately 85 percent, and one estimate (Rotberg) indicates that 75 percent of those who enter fourth grade are in urban schools. Most rural schools provide education only through the fourth grade.

Only about 6 percent of those of high school age were in school in 1968, mostly private schools. All secondary schools are in cities and have part-time teachers. Vocational and technical students totaled only 5,000 in 1968; only two schools prepare technicians and skilled workers for industry (enrollment 325 in 1967) and the majority of the graduates emigrated to the U.S. between 1964 and 1969.

The Secretary of State for National Education administers all urban schools. The American Marines (1915-1934) established the rural schools which are administered by the Secretary of State for Agriculture, National Resources and Rural Development. The amount spent on education (1971-72) represented about 13 percent of total government expenditures. The rural schools, serving 90 percent of the school age population, make up less than 40 percent of the total number of schools, teachers, and students, and receive only 10 percent of the appropriation for education. The teaching in the rural schools was influenced by the U.S. occupation while the urban schools followed the classical French system, stressing academic knowledge learned by rote. Private schools, serving half of the urban student enrollment, provide a higher quality of education than the public schools.

Expansion of higher education (2.2 percent a year since 1960) has taken place primarily in areas not essential to economic development: ethnology, law, international relations, and theology. In 1968, at the one institution of higher education, the State University of Haiti, 40 percent of the 1,500 students specialized in law, 26 percent in medicine, 6 percent in science, and only 3 percent in agriculture. The 226 professors were all part time. The government's appointment of teachers, including those at the university level, is influenced by political considerations.

The language problem is particularly difficult. Although 90 percent of the population speak only Creole, Creole has little in the way of written works, nor until recently has it had an accepted orthography. During the forties, 40,000 people were said to have learned to read and write Creole using a simplified orthography, and two programs in the fifties used two other methods. In the sixties, after the official adoption of an orthography which facilitates the learning of French, the National Office of Community Education claimed to have awarded certificates to 66,000 people (2.5 percent of the population over 15 years of age) by 1965. The results of these various literacy drives cannot be accurately measured but they are unlikely to have significantly changed the proportion of literacy in the overall population. There is no available information on the number of rural schools teaching in Creole.

Lack of communications leaves most of the population as isolated as does the transportation and educational systems. About 30 percent of the households have access to radios, but most of the broadcasts are in French. There is one television station which serves only metropolitan Port-au-Prince and broadcasts almost entirely in French. In 1970, there were 27 well-attended motion picture theaters in the larger towns. All of the six newspapers, published in the capital, and reaching only about 13,000 persons, are in French; because of poor transportation, only Cap-Haitien, Jérémie, and Les Cayes receive regular distribution. The USIS monthly bulletin, Actualité, is an influential periodical with a circulation of 4,000 copies.

ECONOMY

Haiti is the poorest, least developed country in the Region of the Americas and one of the poorest in the world. The gross domestic product (GDP) per capita is less than $100, one-fifth of the Latin American average. The Haitian economy depends heavily on the agricultural sector, which consists mainly of subsistence farming on small, individually owned plots. The industrial governmental, and commercial sectors are comparatively small. Tourism, except during recent times of domestic turmoil, makes up the deficit between the slightly smaller level of exports and imports.

At the present time, an upward trend is seen in the economy with an average 4 percent increase per year in the GDP from 1968 to 1973. However, since this apparent recovery follows a period of economic decline in the sixties, the 1975 GDP is only slightly higher than it was 15 years earlier, and the real per capita GDP actually declined by nearly 14 percent from 1962 to 1971. In the most important sector -- agriculture -- production declined 30 percent in the sixties. The most favorable signs of an upward momentum in the economy are increasing tourism, continued growth of light manufacturing, increasing Government revenues and a favorable official attitude toward public sector investment, and cooperation with international agencies.

Origin of the Gross Domestic Product

Agriculture is the chief economic activity, employing more than 80 percent of the work force, and accounting for 47 percent of the GDP and 50 percent of the value of exports. Despite the importance of this sector, growth has been very modest during the recovery period. The Government now plans to turn its attention to the development of agriculture after recently concentrating on infrastructure, mainly power and transportation.

The problems of agriculture are numerous, predominantly deficiencies in soil fertility, irrigation, care of crops and cattle, crop storage, and transportation. Crop rotation, use of fertilizer, and other modern methods are rare. Existing irrigation systems are in disrepair and essentially inoperable. Storage facilities are inadequate. The road network is in poor condition. Marketing techniques are primitive and credit facilities are scarce.

Most of the population is crowded onto the arable land in small, privately owned farms averaging 2.5 acres. In 1965 population pressure on farmland and pasturage was 178 inhabitants per acre, the highest density in Latin America. Large plantations were broken up after independence in 1804 and the system of inheritance continues to further fragment the land and makes mechanized farming unfeasible. Much of the fertile land is mountainous, further hampering efficient use and encouraging erosion. Once fertile land is being depleted through generations of use and misuse.

Although manufacturing grew at the rate of 9 percent a year for 1970-73, the percent of the GDP in 1973 from manufacturing was a relatively small 11 percent. Some 80 percent of industrial output is centered in items for domestic consumption such as cement, flour, soap, cotton textiles, etc. An important success story has been the recent rapid growth of small assembling industries which use imported materials to produce finished articles for export. It is estimated that 10,000 jobs have been created by these industries.

Tourism increased by 35 percent per year but is still very small compared with other Caribbean countries. The average stay of tourists arriving by air is only five days, reflecting in part the poor transportation to Cap-Haitien, the former capital, in the north or to Les Cayes and Jacmel and their beaches in the south. Any large expansion of tourism will depend on the training of personnel and considerable investment to provide related services and to develop and restore beaches and historical sites. The Government has been setting guidelines for the development of tourism; an OAS mission to Haiti is also working on future development plans.

Infrastructure

Roads are the most important means of transportation. Only two small industrial railroads and 60 miles of navigable waterways exist. For the most part, the network of roads is adequate but nearly all need repair or replacement due to deterioration. Maintenance exists in principle but not in practice, and roadways are often cut by small streams, damaged by heavy rains, and blocked by landslides in the mountainous areas. The southern highway, leading to the main producing area of the country, continues to deteriorate and occasionally becomes impassable. Only a few miles were paved in the last two years, although the road is a high government priority. Problems include the division of responsibility for road construction between four different agencies, and the use of pavement instead of cheaper gravel surface in spite of limited funds. Most bus and taxi facilities, privately owned, are in the Port-au-Prince area. Passenger cars far outnumber buses and trucks.

Development of coastal shipping would provide connections between the various isolated economic regions of the country. This concept has been explored for several years but with no definitive action to date. The Port-au-Prince harbor needs to be deepened to accommodate ships, particularly cruise ships, which now must dock in the bay. The lack of transportation facilities hampers not only communication, rural development, marketing, and industrial growth, but also the development of tourism.

The airport at Port-au-Prince, managed by Pan American Airways, has provided air access to Haiti since 1965. In part to promote tourism, the Duvalier International Airport for jet traffic was completed solely through national efforts in 1967, a remarkable accomplishment. A domestic airline serves 5 cities and has a good safety record, but travel on it is expensive and uncomfortable and the schedules are not reliable. Because of deficiencies in other means of transportation, however, air transport has taken on greater significance for passenger and freight service.

The shortage and high price of electricity has also hindered Haiti's growth. After taking office in April 1971, the new President inaugurated the first hydroelectric power station, a project that had been planned and under construction for many years. This new source of power will double the capacity in Port-au-Prince, eliminate the blackout of recent years, and provide power for a new industrial park now under construction.

The water management system, highly developed in the eighteenth century, is essentially inoperable, lacking maintenance. Agriculture thereby suffers from the periods of drought and from soil erosion from preventable flooding. Flooding also damages roads, and streams are filled with silt from the runoff.

Telecommunications, privately owned, suffer from the same lack of maintenance as other elements of the infrastructure. Most of the 5,000 telephone receivers are in Port-au-Prince, with others located in cities. High-frequency radio provides the main source of communication outside the capital.

Foreign Trade and Foreign Investment

Foreign trade is vital to the economy because of the small domestic market and the limited mineral and fuel resources. Coffee is by far the major export item. Other important exports are sugar, sisal, and bauxite. Imports include wheat, flour, cotton, machinery, vehicles, and oil products. The United States is Haiti's principal customer and the United States also supplies 75 percent of Haiti's imports.

Both sugar and coffee have failed in recent years to meet international quotas even though coffee production increased by 21 percent in FY 1971. Shortfalls in these two important export crops are in part due to Government policies of pricing and taxation. The major factor in the low production of sugar is the set price (since 1948) of $4.10 per ton to producers, the lowest of any sugar-producing country in the Caribbean. Limited refining capacity and increasing domestic consumption are two other factors. Due to high taxes and charges of intermediaries, the coffee producer received only 35 percent of the export price of coffee in 1971, compared to his 65 percent share in 1950. Many coffee trees are old and grow more or less uncultivated. Yield per hectare is consequently only half that of Guatemala and Costa Rica.

Of total United States and multilateral aid to Latin America ($15.9 billion) in the sixties Haiti's share was the lowest of the 22 countries ($14 million). Various international agencies are showing renewed interest in loan and grant programs in light of the improved economic and political climate. Private investors are also showing interest in the areas of tourism and the assembling industries for which Haiti can supply cheap labor.

Public Sector

Fifty-five percent of Government revenues originate from taxation of imports and exports. Revenues and expenditures vary, therefore, according to prevailing world prices and the level of harvests. Taxation is not generally planned to encourage production of export items or to favor certain imports necessary to development. Regressive sales taxes account for 14 percent of revenues. A graduated income tax exists but revenues are small because of the large number of personal exemptions and poor administration. Investment rates (1 to 2 percent of the GDP or 12 percent of total government revenues) and savings rates are low by international standards.

Although the Government owns only a few industrial concerns and the largest bank, it indirectly controls the distribution of nearly all manufactured goods through taxation by the Tobacco and Match Monopoly (Régie du Tabac), one of several agencies which do not make their accounts public. Public sector deficits have to be financed by borrowing from the Central Bank and also *ad hoc* compulsory loans and assessments from private businesses and individuals. The Government chronically falls behind in paying wages of government employees and in payments for goods and services.

Fiscal operations are excessively complicated. Problems include the absence of a comprehensive code of laws assembled for ready reference and the consequent *ad hoc* nature of legal decisions by several different agencies, particularly the powerful Tobacco and Match Monopoly (estimated revenues: $10 million).

Administrative confusion follows fiscal confusion. Specific roles of various ministries are not institutionalized and tend to take on the character of those in charge. Fluctuating revenues and political support make political futures of persons and programs uncertain. The National Development and Planning Council (CONADEP), established in 1963, is responsible for programming Haiti's development but does not control all investment expenditures. Certain autonomous agencies, such as the Agricultural and Industrial Development Institute (IDAI) and the Metropolitan Water Supply Agency (CAMEP) make investments independently of the central

government budget. This lack of institutional definition, continuity and accountability, plus difficulty in preparing and administering suitable projects, make large increases in external financing unlikely. An agency under CONADEP, aided by international organizations, is making serious attempts to simplify fiscal operations.

Labor Force

The labor force in 1960 was estimated at 2,335,000 with the following distribution by sectors: agriculture 87 percent, industry 2.7 percent, construction 0.5 percent, commerce and finance 2.9 percent, services 4.2 percent, and other activities 2.7 percent. Unemployment and underemployment figures are not available and are not meaningful in an economy where 80 percent of the work force is engaged in mere subsistence agriculture.

The supply of skilled labor is small as is the demand in the generally stagnating economy. Haiti has, however, a small number of competent professionals and technicians in fields important to economic development. These are inefficiently used since government assignments are made mostly for political rather than economic reasons. The "brain drain" has been considerable, with some professionals and skilled workers continuing to leave in spite of a government ban in 1965. A change in economic conditions and political amnesty might attract many Haitians back to the country.

Only 13 percent of the labor force were wage earners in 1950 and this percentage dropped drastically in the sixties; more than half of the wage earners were employed by the Government. The sharp decline in wage earners in private industry has been largely due to declining world demand for sisal and the closing of the larger sisal plantations in the sixties. Although some of these have recently resumed operations, employment has not reached former levels.

Most of the labor force does not participate in the money economy except to sell a small amount of agricultural produce. Wage earners generally are paid about $1.00 to $6.00 a day. Wage legislation (1970) fixed the minimum wage between 3.5 to 5 gourdes a day $0.65 to $1.00 but piece-rate wages are common in industry. Minimum wages are supposed to be adjusted according to changes in the cost of living, but this has not taken place in the last few years as consumer prices have not increased substantially. There are,however, sharp seasonal and daily fluctuations in prices due to irregular supplies in isolated communities. Food spoilage, due to poor transportation and storage facilities, contributes to high costs. Dietary intake has been observed to change radically from day to day in relation to prices in the marketplace.

Most fringe benefits, in spite of legal provisions, exist only for those workers in a few foreign-owned companies. Enforcement of a law establishing obligatory worker insurance for illness, maternity, old age and accidents has been limited. Up to 1970 about 35,000 workers were covered. Working conditions are hazardous, and reports indicate that there was one accident for every 10 workers covered by insurance in 1963-64.

HOUSING AND SANITATION

The housing situation is critical. A survey in 1959 revealed that half of the houses in Port-au-Prince were substandard. Only about 20 percent of the housing in the country might be considered reasonably satisfactory. Slums in Port-au-Prince rival the worst in other Latin American countries.

In 1965 the Haitian Institute of Statistics estimated the housing shortage at 400,000 units and this number has since risen. The private sector, which has traditionally had responsibility for housing, has had little incentive to build because of economic conditions, lack of credits, and the high cost of materials in the last decade. The public sector established a National

Housing Bureau (ONL) in 1966 to plan and construct housing. The only large public housing project so far is the Simone Duvalier Development in Port-au-Prince (954 apartments). The new President has declared that low-cost housing is a top priority. The ONL plans to reduce the housing shortage by one-third over a 25-year period by constructing an average of 5,000 units a year, at a cost of $7.5 million annually.

The typical rural house is a one- or two-room structure, with a framework of bamboo or tree branches attached to poles driven into the ground; it is generally plastered with adobe, whitewashed, and has a thatched roof and dirt floors. Buildings in villages generally have several rooms, a metal roof, and are made of concrete or stone. Upper class homes equal those of the upper class in other Latin American countries. Crowding is universal and houses are shared with animals. Water is brought in from the nearest stream and is almost always contaminated. Communicable diseases take a heavy toll among the human and animal populations.

The lack of potable water is one of the most serious problems in the field of public health. There are only 14 water supply services in Haiti and none of them can be said to provide really safe potable water. In the metropolitan area of Port-au-Prince and Petionville (with approximately 500,000 inhabitants), less than 30 percent of the population are supplied with water from house connections, while another 20 percent have fairly easy access to public fountains. It is estimated that the localities served in the interior of the country have a total population of a little less than 200,000, but only 3,855 houses have direct connections.

Taking into consideration the growing population of Port-au-Prince, there is a clear need to improve its water supply system. At present this system is managed by the Centrale Autonome Metropolitaine d'Eau Potable (CAMEP). In 1965 the Inter-American Development Bank (IDB) made a loan of US$2.38 million for water supply, which was followed in September 1970 by a second loan for US$5.1 million. Implementation has been unsatisfactory largely because of lack of drilling equipment for wells.

About $1 million has been budgeted for water supply development in rural areas in 1974, but implementation rates have been so poor in these areas that it is doubtful that even this modest amount will be spent. Water supply outside Port-au-Prince now falls under the administration of the Cooperative Pour l'amelioration en Eau Potable (COALEP). However, this institution lacks the financial and human resources to make more than a small contribution in this sector.

There is practically no sewerage system functioning even in Port-au-Prince. Such drains as are available cannot handle the stormwater during heavy rains, with the result that the main streets are flooded with polluted water at such times. Sewage is disposed of by individual means. Better houses have septic tanks and cesspools, but the majority of the population of Port-au-Prince use latrines. The rural population has no sanitary facilities and uses nitesoil as fertilizer. Solid waste is collected in the larger localities, but its disposal is inadequate.

Food hygiene activities consist solely of supervision. The central laboratory in Port-au-Prince does not have sufficient personnel, material, or equipment to undertake any type of investigation. Supervision of abbatoires (slaughterhouses) is also inadequate, although undulant fever and bovine tuberculosis occur in cattle, and tapeworm in cattle and pigs. There is insufficient inspection of the food markets, which are crowded and unsanitary.

Chapter 3. NUTRITION AND AGRICULTURE

NUTRITION

Nutritional deficiency and malnutrition are clearly among the most serious health problems in Haiti. The nutritional situation is probably better studied in Haiti than in most other underdeveloped countries. As will be seen from the accompanying table, a long series of nutritional surveys have been carried out by highly trained foreign and Haitian experts. Foremost among these is the appraisal of nutrition in Haiti by Sebrell and collaborators, which covered the whole country, in 1957. A number of partial surveys had been carried out prior to this and six supplementary surveys were carried out between 1965 and 1968. Also of special interest is a study by Derick and Patricia Jeliffe, on the prevalence of malnutrition in Haitian preschool children. The results of these surveys and an analysis of the Haitian nutritional situation have recently been published by I. Beghin, W. Fougere, and K.W. King, "L'Alimentation et la Nutrition en Haiti," Presse Universitaire de France, Paris, 1970.

The Haitian peasant suffers from multiple nutritional deficiencies. By far the most important are: insufficient calories and protein resulting in underweight, poor muscular development, short stature, and a high total serum protein with relatively low serum albumin. The situation in children is particularly serious as seen in Jeliffe's figures from 1958, where high levels of malnutrition were found with the maximum between one and five years of age.

Age	Gomez Scale II and III Malnutrition	Kwashiorkor
0 - 1	11 percent	--
1 - 3	24	6.5 percent
3 - 6	24	2.2
6 - 12	10	1.2

On the basis of available observations it is believed that malnutrition worsened between 1958 and 1970, and that Jeliffe's figures very likely are too low for the present situation. Six months has been identified as the age when retardation begins. This is unfortunately the age when some 20 percent of mothers wean their children on herb teas, starchy gruels, bananas soaked in sugarcane water, and similar foods from which protein is conspicuously absent. All health indices are affected seriously, directly and indirectly, by the prevailing malnutrition, quite particularly morbidity and mortality from gastroenteritis and tuberculosis.

Apart from the all-important protein/calorie malnutrition, there is considerable seasonal vitamin A deficiency and keratomalacia in third degree malnutrition cases between ages one and four has been demonstrated by a WHO consultant, Dr. Escapini in 1963. There is also seasonal ariboflavinosis with cheilosis . A certain amount of goiter is found and this problem has been studied by Dr. Noel, the President of the Haitian Research Council. Moderate anemia is frequent, whether from deficiency of iron, protein, vitamins or from anchylostomiasis, and malaria.

Diet

The Food and Agricultural Organization of the United Nations estimated in 1966 the Haitian daily per capita food consumption as 1,633 calories with 47 grams of protein (see tables 7 and 8). The average of the abovementioned series of Haitian nutritional surveys was 1,728 calories with 39.2 grams total protein, of which 7 grams were animal protein (table 7). Beghin, Fougere and King (1970) came to a figure of 1,700 calories with 41 grams total protein (7.1 grams animal protein - table 8).

It will be noted from the tables that the food staples most in demand are high in carbohydrates: corn, millet, manioc and bananas. Rice is generally much too expensive to form part of the rural diet although rice and peas are a creole specialty much enjoyed in Port-au-Prince. Bread made from imported wheat is largely confined to urban areas. Beans and peas are available in the rural markets and constitute an important supplement to the main food article -- corn -- which is poor in lysine and tryptophan. Recently attempts have been made to provide a high lysine corn. This has met with some resistance, as the Haitian peasant prefers a "yellow flint" type. A new high lysine corn has now been produced, very similar to the preferred Haitian type. Sugar is utilized in large quantities in the Haitian diet in rural areas, particularly as coarse brown sugar called rapadou. Green vegetables grow well in Haiti above a certain minimum elevation, but are largely consumed in urban areas. In addition citrus fruits, avocados, breadfruit and mangoes are eaten extensively. Mangoes are particularly important because of their high vitamin A content. They are generally available for five months of the year, but no serious attempt has been made to conserve the plentiful supply for the rest of the year.

Beef and lamb are far too expensive for rural populations. A certain amount of goats and pigs are consumed by the peasants. Farmers may keep a few chickens but eggs and poultry are usually sold to the urban market.

It is often stated that the Haitian peasants live from the products of their gardens and fields (subsistence farming). This is not entirely true. Most of the products from the family plot are sold in the local markets, usually eggs and chicken and generally pork, so that only root vegetables and sugar cane grown on the plot are also consumed there. Rural markets base their prices on supply and demand, and the considerable fluctuations in prices make the rural families more dependent on a money economy than is the case where subsistence farming prevails. The social role of the market may be just as important as the economic. The fact that the house wife buys a large proportion of the food means that she has a certain opportunity to choose. Her menu is not entirely dictated by what can be grown on the family plot, but is determined by a number of other cultural factors. For instance, fish and shellfish are common food articles in Port-au-Prince but are not popular outside the urban areas.

Office of Nutrition

In order to deal with the problem of malnutrition, the government set up the Office of Nutrition in 1962. This office consists of two divisions, one dependent on the Ministry of Health and the other on the Ministry of Agriculture. These two ministries furnish personnel, housing and recurrent expenditures for the Office, a governmental organization. Each division controls its own personnel, but in practice "marriage" between agriculture and public health has been achieved in Haiti to a larger extent than in most Latin American countries.

The functions of the Office are largely of a technical and consultative nature. Among the most important functions are:

(1) Definition of the nutritional problems of Haiti: Nutritional surveys are undertaken. The Office is assisted by the nutritional laboratory, for which it is technically responsible. The laboratory is, however, administratively a part of the National Hygiene Laboratory.

(2) The setting of objectives for problem solution: The Office is responsible for setting national objectives and priorities in the field of nutrition. At the local level the Office makes recommendations for low cost practical solutions to rural problems such as the Mothercraft Centers (Nutrition Rehabilitation Centers).

(3) The setting of norms and standards: The Gomez classification is utilized in Nutrition Centers. Standard weight curves have been prepared as well as tables of the composition of different foodstuffs in the Haitian diet. A number of educational pamphlets have been prepared in Creole.

(4) Technical advisory services: This Office gives technical advice to the Ministries of Agriculture and Public Health, and to other public and private organizations interested in nutrition.

(5) Training of personnel: There is a scarcity of adequately trained staff which hinders the expansion of the nutritional program. Up till 1969 two agronomists, a biochemist, a dietician and five physicians had received special training in nutrition at international courses in Molina, Marseilles and Paris-Dakar, INCAP (Institute of Nutrition for Central America and Panama) in Guatemala, and Columbia University in New York. The office itself has contributed to the training of auxiliary personnel. In 1964 a course in nutrition was organized for social workers (assistants sociaux) and in 1966 the office participated in a course organized by the Interamerican Child Institute. Students from the U.S. have been sent for internships at the Bureau (Columbia University, Virginia Polytechnic Institute, University of South Carolina, etc.).

(6) Coordination of public and private activities in the field of nutrition.

(7) Special activities: The Office has its own special research and demonstration program devoted to operational activities. This program is centered on methodological studies and setting up criteria for the evaluation of work accomplished. The main area of study has been protein-calorie malnutrition: (a) setting up of nutrition centers (Centres de recuperation nutritionelle) and (b) development of AK-1000, a mixture of cereals and beans for small children.

The Nutritional or Mothercraft Centers

A pioneer role may be claimed for Haiti in the area of protecting the preschool child through the organization of a program of nutritional centers (centres de recuperation nutritionelle) functioning at low cost and with considerable effectiveness. The model for this work was designed by Dr. Bengoa of WHO and has been realized most fully in Haiti.

In essence a nutritional center is a place where groups, generally of 30 children of preschool age, are put on a well-balanced nutritional regime, while at the same time their mothers receive elementary health education and instruction in the proper preparation of food for their children. The center itself is normally located in a house in the village which has been made available by the community. Furniture, kitchen utensils, washing facilities, etc. are of a type normally in use in the villages. The center is run by a girl (the responsable) who has had a minimum of nine to ten years of schooling and has received practical training in nutrition at the Bureau. She has a cook-helper but the heavy work is all carried out by the attending mothers, who come in groups of three or four every day for this purpose. (This is apart from bringing the children to the center every day.) Since every mother is on duty every tenth day, she will have participated in the center activities about a dozen times during the four months her child has been treated there.

The children arrive at the center about eight in the morning and leave about three in the afternoon. They are served a small breakfast about half past ten, dinner towards midday, and a small snack or some milk before they leave. All meals are prepared and served by mothers,

and in this way they receive their training, combined with discussions with the responsable on the choice of foods, ways of preparation, and elementary rules of hygiene. Simple educational activities are arranged for the children such as playing or singing. A few beds are available so that if necessary a child can rest, but only rarely, in case of emergency, is the child kept overnight. The child must attend all six weekdays for the period of four months. The selection of children's groups from the village or area served by the center takes place after a certain amount of propaganda in the village and invitations to mothers to bring their preschool children. They have to bring a birth certificate in order to establish exact age. All are weighed and the weight is compared with the normal weight for their ages. The group is selected, utilizing the Gomez classification and giving priority to those falling in the third degree of malnutrition (i.e. less than 60 percent of standard weight for age). Second priority is given to second degree Gomez (between 75-60 percent standard weight for age). All children with oedema (kwashiorkor) are included in the third degree. They constitute on an average not less than 7 percent of the children in the village. Whenever possible, each child is seen by a physician before being admitted. Occasionally a number of bad cases will have to be kept longer than the normal four months.

Only locally available food is served to the children. Milk is never given in large quantities since most mothers would be unable to provide this for the children once they have finished their attendance at the center. The principal message to get across to the mothers is how best to utilize local foodstuffs and how best to combine them to obtain the greatest nutritional value. (The menus are calculated according to recommendations of the National Research Council of the U.S.)

The four months' stay at each center allows them to handle about 100 children every year while at the same time educating the mothers, who are generally among the poorest and least educated in the community. The cost for an independent center (i.e., a center not attached to a health institution) runs about U.S.$2,500-3,000 per year. From this amount, salaries of the responsable and her assistant are paid, as well as food supplies, etc. This comes to US$0.25 per child per day. In cases where the nutrition center is located in a health center, the recurrent expenditures are generally limited to buying food supplies, which on the average comes to about US$0.09 per child per day. It is of some interest that US$0.09 is exactly what the average rural Haitian has available for food per day, which means that it is at least theoretically possible to ensure an adequate daily diet for Haitian children.

Since nutritional centers are the most hopeful approach to a low-cost service that might possibly be expanded into other medical areas as the nutritional status begins to improve, their organization has been given in some detail. It may, therefore, be worthwhile to look at the results.

(1) The restitution of the child: There is reason to believe that this has been satisfactory without being spectacular. At Fond-Parisien where the first center was opened, the children admitted were compared with a statistically identical control group. Weight, total plasma proteins, plasma albumin and brachial muscular circumference were found to have risen to a statistically significant degree. The psychological improvement was remarkable. It might, with more money, have been possible to have obtained even greater improvement, but the important point is that the improvement effected was obtained without any more money being used than was (on an average) supposed to be available to the mothers.

(2) The education of the mothers: It is difficult to be definite on this subject; however, at Fond Parisien where all the nutrition center work was started, there is practically no kwashiorkor today in the village of 3,000 inhabitants. Dr. Fougere, the Director of the Office of Nutrition, is of the opinion that the people, whenever not prevented by sheer poverty, apply what they have learned at the centers.

(3) Response of the community: The response of the community according to Dr. Fougere has on the whole been excellent. The fathers have been particularly interested in the agricultural extension part of the projects.

Three types of centers have been utilized. The centers at Fond Parisien, Ganthier and Guerin were not in any way connected with health centers or other GOH health service, but have functioned directly under the Office of Nutrition. In a second type, the center has been integrated with the normal functions of health centers. The same model is used but the health center is in charge and the doctors have the full responsibility. This is the case at the health center of Port-du-Nord. Finally, a third type is the center at the General Hospital in Port-au-Prince which constitutes an integral part of the maternity and child center of the University hospital.

While it is obviously advantageous to have the centers functioning as part of the general health service, this is only possible in comparatively few cases due to the scarcity of health centers in rural areas.

AGRICULTURE

Data on many aspects of Haitian agriculture are extremely limited. Frequently, as pointed out in a recent (June 1974) USAID report on "Rural Sector Assessment of the Republic of Haiti," the same figures, even the exact same tabular material including the errors, are repeated by writer after writer; therefore, as in the case of morbidity and mortality statistics, figures are useful principally in establishing orders of magnitude and trends. There is, however, little difference in the diagnosis of conditions in general or with regard to the general prospects for development in the short term.

The agricultural sector is the most important single sector in the Haitian economy, contributing about 47 percent to the GDP and being the most important source of foreign exchange. While the present rate of population growth is estimated to be slightly more than 2 percent, the GDP has since 1968 been growing at an average annual rate of 4.3, primarily attributable to agriculture at about 4 percent per year. Food production has essentially kept pace with demand, which however, does not mean that the needs of the rural population are being satisfied. Direct taxes on raw and locally processed agricultural commodities contribute about 30 percent of all tax revenues. It should be clearly understood that the low level of earnings -- estimated to be less than US$50 per capita per year -- limits consumption of off-the-farm commodities.

As is the case with rural medicine, the greatest single constraint on agricultural development is lack of concern of the urban elite and certain elements of government for the rural population, a situation going back to the earliest days of Haitian independence. Not only is there an almost total absence of public services in the rural areas, but the rural population bears an inordinate part of the tax burden in comparison to the support services available in these areas. The recent reestablishment of confidence in government, which has been evidenced by the growth in the GDP since 1970, has so far had little effect outside the capital.

Two characteristics are of prime importance in Haitian agriculture: the smallness of scale and the almost total absence of production inputs other than labor. Seventy-five percent of farm units are less than 10 acres -- some much smaller -- and multiple holdings cause further fractionation. There are 750,000 farming units involving 80 percent of the population cultivating slightly over 1,000,000 individual land parcels.

Large-scale farming is limited to sugar and sisal. Of the total cultivated area about 57 percent is devoted to basic food crops, 23 percent of cash or export crops and about 5 percent to industrial crops for local processing. The remaining 15 percent is devoted to a wide variety of fruit, vegetables and legume seed crops.

Livestock is rarely held primarily as a production enterprise, but represents an important repository of savings, second only to land, for the rural population.

It is estimated that producers retain about 30 percent of food items for home consumption, the remainder being marketed through a long marketing chain operated in small lots, chiefly by women.

Tools are of the most primitive kind -- generally only hoes and machetes.are available -- and these tools may be rented for shares of crops among the poorer peasants.

Irrigation is said to be available for approximately 77,000 hectares but less than half is maintained and operated adequately. The Artibonite irrigation system with 25,657 hectares is by far the most important; most systems are small, a fact that presents serious problems in effective distribution and use of water as well as drainage.

Recently there have been some efforts at community development, but traditionally "community" to the Haitian has largely meant the extended family. Thus, attempts at organizing cooperatives have so far met with little success. This has meant that there has been little machinery for the rural population with which to influence government policy, little communication between the rural population and public officials.

An important constraint on raising the rural level of living is the lack of decent roads. Even the two most important road systems -- the northern and the southern roads -- are in disrepair and outside this system peasants are largely dependent on trails. Freight rates are consequently high and the poor and uncertain means of transportation result in high fluctuation in commodity prices.

As mentioned, the supply of basic foods has essentially been in equilibrium with demand during the past decade, but the level of supply leaves much to be desired from a nutritional point of view. The average protein intake is about 30 percent below requirements. Reaching the desired calorie level of food intake would require about 30 percent increase in basic food crop production. The USAID report states:

> While the outlook for the food subsector to continue to satisfy requirements for the traditional food is good, at least in short terms, making up the nutritional gap will be more difficult. Assuming 50 percent of the growth in GDP (the 5-year plan projects an average 7 percent growth in GDP), would be translated into demand for food, only slightly over one-half of the deficit in calorie intake would be made up by growth in GDP. Thus from the demand side the outlook for raising the level of calorie consumption to the prescribed standard must remain remote. The problem is equally serious from the supply side, because increasing production sufficiently to meet the prescribed standard would require increasing food production by almost 10 percent per year, an increase which would be extremely difficult to achieve.

Marketing

The food commodities forming the basis of nutrition, particularly in the rural areas, are: corn, millet, sorghum, bananas, cassava, sweet potatoes and beans. One or more of these commodities generally is produced on the family plot; the others are acquired in the local market. There are no statistics available on the percentage of production which enters the markets.

Women are generally the merchants, buying small lots which are accumulated and transported to larger markets, regional centers or even major cities. Since the internal markets are highly competitive, the normal differential between producer selling price and retail price is low; there are, however, marked seasonal variations in prices.

A major problem is the almost complete absence of storage facilities either on the farm or in rural market centers, which once more -- like the lack of transportation facilities -- results in wide fluctuations in prices.

Institutions

The Ministry of Agriculture and National Resources Development (DARNDR) is the main organization charged with agricultural development. It has three main divisions:

(a) Division of Agriculture and Livestock
(b) Division of Natural Resources
(c) Rural Development Division.

According to the USAID report, the effectiveness of agricultural, promotional, extension, and information and credit services to the rural population remains at a very low level, one factor being the limited contact between extension agents and the farming population.

Four levels of schools provide formal education in agriculture: (1) the Faculty of Agronomy and Veterinary Medicine providing four years of post-secondary training with a capacity for enrolling 48 students per year; (2) an agricultural technical school providing technical education at the secondary level with the capacity to enroll 40 students every two years; and, (3) three agricultural vocational schools with a capacity to enroll 90 students every three years. The Faculty of Agronomy has, since its establishment in 1924, graduated 369 agronomists of which 55 percent have remained in the country in professional work. The middle school is the principal source of qualified extension agents. In 1973, 20 candidates graduated.

An FAO/ILO study has recently recommended special training for community leaders to be provided by mobile units operating from a community leader training center. Through the efforts of community councils and with the assistance of voluntary agencies, a number of savings and credit unions have been established which are reported to have invested close to $100,000 in community development projects.

Production of Specific Agricultural Commodities

Corn occupies the largest acreage and is produced in all the agricultural areas which have sufficient rainfall. The preferred type is "Yellow flint" a type poor both in lysine and tryptophan. Attempts are now being made to introduce high lysine corn similar in physical appearance to the typical Haitian corn. A large proportion of corn is hand-pounded into meal and flour for home consumption.

Sorghum occupies the next largest acreage. It is produced on drier hillsides and the Central Plateau where there is insufficient moisture for corn. Sorghum is eaten as much as corn.

Rice is produced principally in the Artibonite Valley and in small irrigated areas of the southern peninsula. While rice is the preferred cereal in urban areas, it is too expensive to be of importance in the rural diet.

Beans come in a number of varieties. Red beans are produced mostly on irrigated areas in the plains, while the pigeon pea is produced on drier and steeper slopes and in the Central Plateau. Beans form an important (lysine and tryptophan) addition to corn in the rural diet.

Root crops, particularly sweet potatoes and manioc, are common throughout the country and provide a large percentage of caloric intake.

Sugar cane, while grown everywhere there is sufficient rainfall, is commercially concentrated in three areas: Cul de Sac, Les Cayes and Plaine du Nord. Sugarcane for direct consumption, processing into rapadou and alcoholic products, accounts for about 75 percent of production.

Bananas and plaintains are an important source of calories and are widely grown for local consumption. Since the withdrawal of United Fruit Company there has been little export of bananas.

Fruit is available in considerable variety -- mangoes, avocados, papayas, pineapples -- and constitutes an important source of vitamins (A, B, and C particularly). The most important export crops are coffee and sisal. Because of the increasing importation of edible fats and oils, oil crops (coconut for copra, sesame on an experimental basis, cotton seed, and sunflower and soya beans in limited areas) for import substitution are receiving priority. The same is the case with tobacco.

Production Technology

The technology for production is of a low order with very low unit yields. The soil is generally prepared by hand. Plows and tractors are rare and planting, weeding and harvesting are carried out with hoe and machete as the only tools. There is little use of improved seeds and planting stocks. In 1973 only 3,000 tons of fertilizer were used, partly due to limited extension and promotional efforts, partly due to cost.

Agriculture in the GOH Five-Year Plan

Agricultural development is the second priority in the GOH five-year plan, second only to the transportation infrastructure, which was allocated 28 percent of the development budget. The plan calls for an increase in supplies of basic foods to satisfy the growing population and improve the level of nutrition, at the same time increasing the production of raw materials for local industry and for import substitution, and increasing earnings from export commodities.

The Future of Agricultural Development

So far the progress which has been made in improving living standards and in building and improving capital infrastructure has been confined almost entirely to the urban minority. If anything, there has been a loss in the rural capital and resource endowment and an increase in rural underemployment. There is an urgent need to reverse the continuing deterioration of rural resources, both capital and human, and for the provision of increases in rural incomes. Among the key agricultural problems are nutrition and erosion. As will be seen elsewhere in this report the work of a number of voluntary agencies in several rural areas has shown that there is a latent potential for leadership and cooperative community action. There is a beginning of community participation organization under self-chosen leadership in defining development objectives and action programs (see HACHO). Certain voluntary agency programs have emphasized health, education and other community development, but have also begun to give attention to activities leading to greater agricultural productivity (eg. HACHO at Terre Neuve). Increasing population will continue to exert pressure on the limited land resources. According to the USAID assessment, although the available land is not intensively used, greater intensification of the use of hillside and mountainous areas will only mean intensification of erosion. Soil erosion is probably the most serious problem facing agricultural policy makers in both the short and long term. Population pressures do not permit great reduction in use of steep lands, so corrective measures must be consistent with continuation of production in those areas.

Chapter 4. ORGANIZATION OF PUBLIC HEALTH SERVICES

The Department of Public Health and Population is placed directly under the Minister of Public Health and Population. The Department is comprised of four main bureaus: the Secretariat of State for Public Health and Population, the Directorate General of Public Health, a Bureau for Medical and Allied Education, and a Bureau for Population.

The Secretariat of State for Public Health and Population is largely concerned with overall policy formation, planning and evaluation, together with the Directorate General, with population problems, medical and allied education, etc. The Directorate General is charged with the administration and operation of the public health services. It has two main sections: Administrative Services and Technical Services. There are five divisions under Technical Services: Public Assistance (Assistance Publique), Public Health and Preventive Medicine, Community Medicine (Medecine Communitaire), Odontology, and the Division of Family Hygiene. This last division was established in 1971 when the Department of Health and Population was reorganized. It is, as described later in this report, responsible for the supervision of all activities, both private and public, related to maternal and infant health, including family planning. The Division of Medical and Paramedical Education depends jointly on the Ministry of Public Health and on the Ministry of Education. This means joint jurisdiction over the Schools of Medicine, Pharmacy, Dentistry, Nursing, Auxiliaries, and Medical Technology.

The country is divided into 11 sanitary districts, each of which is administered by a physician, who is in charge of the medical establishments of his district. Until now the administrative arrangements have been highly centralized, with all real authority at the Department of Public Health and Population level. As will be described later in the section on "National Health Planning," there are plans for regionalization and decentralization with five regions to be largely responsible for the planning and operation of their own services.

Certain health activities are carried out by autonomous bodies such as the Institute of Social Insurance of Haiti, the Special Welfare Service, and the Old Age Insurance Board. One organization, the Haitian American Community Help Organization (HACHO) plays an important role in the delivery of health services, preventive and curative, in rural areas. A very important role is played by a number of non-profit voluntary agencies operated mainly be religious and charitable organizations.

FINANCIAL RESOURCES

The official budgetary resources of the government health sector in 1969-70 amounted to US$0.79 per capita. In the 1973-74 fiscal year it was US$0.89 (using a population figure of 5,000,000). GNP in 1972 was about US$120 per capita, a considerable increase from 1968 when it was 73.9 per capita. The health sector received 13.7 percent of the regular governmental budget in 1968-69 and 13.3 percent in 1973-74. This is a very high percentage in comparison with most countries and does indicate that health is considered a high priority by the government.

There has, however, been little increase in the total national budget over the last years, and with increasing population, the available amount per capita is therefore bound to decline. The health department budget is not classified by programs or activities, but figures for the individual divisions are available and are given on the following page.

HEALTH BUDGET BREAKDOWN

Division	Amount	Percentage
Administration General	834,568	18.7
Division of Public Assistance	1,296,277	29.2
Division of Public Hygiene and Preventive Medicine	650,020	14.7
Division of Community Medicine	786,156	17.6
Dental Division	59,523	1.3
Blood Bank	5,808	0.1
Medical and Pharmaceutical Faculty	87,949	1.9
Dental Faculty	39,771	0.9
Nursing Schools	127,995	2.9
Psychiatric Center	38,737	0.9
Transport and Maintenance	145,725	3.3
Special Services	15,604	0.3
Medical Technician, Anesthesia and Laboratory Schools	12,033	0.2
Medical Research	3,348	0.1
Minister's Technical Services	39,961	0.9
Division of Family Hygiene	19,948	0.4
Mental Asylums	117,980	2.6
Garbage Collection	173,206	3.9
TOTAL	4,454,609*	100.0

* Rounding error -- total is actually 4,454,614.

This presentation obviously does not permit analysis of the utilization of resources, efficiency or coverage. It is a simple "passive" statement in which the technical health personnel have not participated and which can only be utilized as a guideline for the determination of ceilings. There is no account for expenditure classified by activities.

There is a very detailed line budget available dealing with salaries. Both the higher level salaries and those at the intermediate level are extremely low. Thus, the Director General of the Health Department, the official second in rank only to the Minister himself, receives a monthly salary of US$400. (For representative monthly salaries see Table 11.) It is, therefore, obvious that most physicians working for the health department must have income from other sources. In some cases such income is derived from international organizations or voluntary agencies.

The functions related to the preparation, the administration, and the control of the national budget are vested in the Ministry of Finance and Economic Affairs. Each Department submits a proposed budget. The Ministry of Finance receives all such requests, revises and readjusts them and then proposes a consolidated national budget to the Cabinet, where it is discussed and approved. Once approved, all funds are deposited into the account of the Haitian National Bank, and each Ministry is issued funds against its account on the basis of one-twelfth of the total each month. The third major entity in the field of public finance is the "Council of Accounts" (Chambre des Comptes), an independent auditor group which monitors the fiscal aspects of disbursements, contracts, and expenditures of each department.

As already indicated the budget presentation for the Ministry of Health is in the form of line items, precluding an understanding of what is actually being done with the resources and making program evaluation impossible. It is believed that the present budget may be the last or next to the last in functional form. An advisory committee is currently studying the problem of budgetary presentation and has decided that the present format does not serve the best interests of the Ministry. However, the requirements of the Budgetary Law force the utilization of this antiquated line budget. The advisory committee is therefore recommending that two budgets be prepared if the law cannot be changed: one functional for presentation to the Ministry of Finance and Economic Affairs, and the Cabinet -- the other, a program budget for internal use.

The vast majority of the health budget is for salaries (approximately 75-85 percent), leaving US$1 million to $1,250,000 to pay the costs of the total health system in terms of materials and supplies, drugs, travel and transportation, rent, food, equipment, and administrative costs of operation.

A special problem is constituted by a number of semi-autonomous vertical programs over which the Ministry of Health and Population has little authority, but nonetheless provides partial funding. Examples of such programs may be found in the areas of tuberculosis control, family planning, maternal and child health, nutrition, and most importantly malaria control (SNEM). Separate administration of such programs may waste scarce resources particularly in the area of transport and communication. Coordination of activities could theoretically result in an improved health delivery system at a lower cost. Resources of a non-governmental nature play a very important role in the Haitian health sector and a special chapter is devoted to the development assistance programs of non-profit organizations in Haiti. The financial resources made available by international organizations, bilateral programs and voluntary agencies are not known in their totality. The principal contributors were given as follows for 1970 by WHO:

USAID	Malaria Program	US$1,500,000
HACHO	Health and Family Planning Community Development	US$167,000
PAHO/WHO	Local Programs	US$400,000
UNICEF		US$300,000
CWS CRS CARE	in goods	US$1,200,000

To this total of US$3,567,000 must be added US$10,000 in food from the World Food Program (WFP). It is estimated that private foundations and religious bodies spend another million dollars on curative services.

HEALTH INFRASTRUCTURE

The health infrastructure description is based on "Infrastructures, Santé Publique" (Port-au-Prince 1973). However, in some cases tables from the June 1974 "Rapport sur les differentes activites sanitaires des establissements de santé du pays durant 1971, 1972, 1973" have been utilized. Such tables have been marked (Rapport Section de Statistique, 1974).

The country is divided into 11 sanitary districts, each with its distinct administrative unit. Efforts are underway to decentralize both administrative and technical services in order to obtain: (1) a better distribution of the budgetary resources for health, (2) a more efficient supervision, and (3) a more effective use of the resources. For this purpose plans have been made to divide the republic into five large regions. Each region is to constitute a complete medical/public health system with a regional hospital, district hospitals, health centers and dispensaries. It is intended to have the regional hospitals equipped and provided with technical personnel so that they may act as training centers for the health staff of the region. Organizationally the system will radiate from the regional hospital at the center, via district hospitals to dispensaries, becoming increasingly less complex and specialized.

While the idea of regionalization has been accepted, the realization is still in a planning stage. In the following discussion the older division in sanitary districts is preserved since all information is still available in that form.

Normally the sanitary district has a Base Hospital which at the same time serves as administrative headquarters, with a number of other health institutions spread over the district. The headquarters of the sanitary districts are:

Port-au-Prince
Petit-Goave
Cap-Haitien
Gonaives
St. Marc
Port de Paix
Hinche
Belladere
Cayes
Jacmel
Jeremie

It should be noted that in a number of cases the sanitary districts are not the same as the political or administrative districts.

The distribution of health units are given by departments and arrondissements in Table 12. A comparison may be made of the distribution of beds per 10,000 population and as a percentage of the average as seen from the table on the following page. It should be kept in mind that "bed" is not the same in the capital as in the interior. As an "instrument" the "bed" is obviously far more sophisticated in Port-au-Prince, for instance, than in Jacmel.

Department	Number of Beds	Beds per 10,000	Percentage of Average
West	1,631	13.78	174.21
North	335	5.37	67.89
Artibonite	457	6.99	88.37
North West	490	21.78	375.35
North East	20	1.68	21.24
Central	133	4.14	52.34
South	263	4.90	61.95
South East	115	3.20	41.21
Grand Anse	121	2.47	31.23
TOTAL COUNTRY	3,565	7.91	100.00

It has been suggested that, using a possible coverage radius of 15 kilometers, about 36 percent of the population is "covered" by the health establishment which seems like a very optimistic estimate. Firstly, the quality of "coverage" differs widely from urban to rural areas. Secondly, a fifteen kilometer radius is a rather meaningless measure in a country with such a variation in availability of transport and communication. Along the two main highway systems 15 kilometers may have some meaning -- away from the main highway system it may mean hours of travel by horse or by foot. Physician and nurse availability is for practical purposes nonexistent in many rural areas. The possibility of referral from a rural dispensary is practically nil in many parts of the country. An even more serious problem is the lack of medical supplies and equipment in most health establishments outside the capital.

The occupation rate for hospital beds is given as 52.7 percent for Haiti, with 62.9 percent for Port-au-Prince and 48.7 percent for the interior. The rate outside Port-au-Prince is difficult to determine. Certain provincial hospitals like the main hospital in Cap-Haitien are likely to be crowded, at least as far as the surgical services are concerned. However, the lack of medical supplies becomes known and the monthly attendance reports indicate that there is a high attendance when supplies have come in, which tapers off as supplies run out. Other problems in the rural areas are lack of transport and effective referral. A thorough technical analysis of these problems is essential before any regionalization is decided on.

The health centers offer polyvalent services including medicine and minor surgery, maternal and child health services, control of acute communicable diseases, tuberculosis and venereal diseases, and some environmental hygiene. These health centers are confined to urban areas. Of the 16 centers, 13 are in Port-au-Prince and there is one each in Cap-Haitien, Gonaives and Les Cayes.

Of the 190 dispensaries only a few are urban and provide the main health services for the rural population. Some of the dispensaries placed in provincial towns are attended by a physician, but most are run by nurses or auxiliaries. In 1969 there were 848,156 visits to outpatient clinics. Of these 568,326 or 67 percent were seen by nurses or auxiliaries.

The main deficiencies in the dispensaries are:

1. A very high percentage (over 60 percent) are run by nurses or auxiliaries.
2. There is a serious lack of drugs and basic materials.
3. Referral is generally difficult due to lack of transportation.
4. There is no regular supervision.

According to PAHO/WHO reports, the health system supervises over 29 X-ray installations in hospitals and health centers. There is no information with regard to how many of these are actually functioning, but it is known that in the provincial hospital there is often a shortage of photographic materials. There are 18 facilities for electrocardiography; 12 of these are in Port-au-Prince, plus two facilities for electroencelography.

The present infrastructure does not provide services to more than a small portion of the rural population. This is fully realized by the government, which is anxious to improve the situation. However, funds for medical supplies and equipment and for maintenance of the present infrastructure are already insufficient. Any new construction and increase in qualified personnel will further decrease the amounts available for essential supplies. The available technical staff is not being utilized effectively for lack of transport, drugs and equipment.

Laboratory Service

In 1968 there were 79 laboratories, of which 32 were governmental and 47 mixed or private. Twenty-three of these were in the capital. The most important governmental laboratory is the Central Health and Research Laboratory which establishes norms and standards and acts as referral laboratory. In 1968 there were plans for setting up a special laboratory for handling rabies, anthrax, brucellosis and leptospirosis with cooperation from the faculties of Agriculture and Veterinary Medicine of the University. The University Hospital Laboratory carries out research and undertakes teaching of medical students and laboratory technicians. The laboratories generally have the basic equipment needed for routine examinations, but are not fully utilized due to lack of demand for their services. As elsewhere there is also a serious problem of supplies not being furnished on a regular basis.

Pharmaceutical Supplies and Equipment

One of the most serious problems facing the delivery of health services in Haiti is that of ensuring the provision of medical supplies and basic equipment at all levels of the system. The Division of Supplies and Equipment of the Ministry of Health and Population orders and buys all drugs and supplies for the Ministry through the Magasin de l'Etat, a subsidiary of the National Bank of Haiti, which acts as the sole buyer for all government agencies. All budgeted expenditures for medical supplies and equipment are therefore channelled through the central buying agency.

The Magasin de l'Etat orders and buys from the lowest bidder and stocks its own warehouse, from which in turn, the Division of Supplies and Equipment of the Ministry picks up three months' supply to stock its warehouse. The Ministry receives orders and makes supplies available on a monthly basis for all of Haiti. Outside Port-au-Prince the District Hospitals are the centers for ordering, receiving and supplying all health institutions in their districts. Since, however, supplies are limited and insufficient, the districts must compete. The establishment of priorities takes place at the Division of Supplies and Equipment. Another serious problem is transportation. Since the Division of Supplies and Equipment has no vehicles, the distribution depends on transport paid for by the districts. The districts receive funds from the Ministry on a monthly basis for all expenses except salaries. These funds are allocated by the district directors according to existing needs.

The Magasin de l'Etat charges seven percent for buying and storage services in addition to a 10-13 percent profit margin, giving a 20 percent markup in the price of all supplies. Most buying is by brand name and in packaged form. There is a very small drug industry in Haiti producing a limited number of basic ingredients.

Health Infrastructure - Port-au-Prince

Health facilities in Port-au-Prince in the five different zones are as follows:

Zones	Hospitals	Health Centers	Dispensaries	Total
Haut Ville (I)	1	--	2	3
North (II)	3	2	2	7
Center (III)	6	3	2	11
South-West (IV)	1	2	2	5
Petionville (V)	--	1	--	1
Port-au-Prince	11	8	8	27

Of the 11 hospitals, 5 are governmental and 6 private. This represents 45 percent of the total number of hospitals in the country, while the population served by these hospitals is only 10.5 percent of the total population.

With regard to distribution, it will be seen that the hospitals are largely placed in the central zone (III) with 6 hospitals, and the northern zone (I) with 3 hospitals.

The 8 health centers are all governmental and constitute 50 percent of all health centers in Haiti. There are health centers in all zones except Haut Ville (I).

Dispensaries are also distributed over all zones except Petionville (V).

Zones	Number of Beds	Percentage	Inhabitants	Percentage
I	50	3.94	45,024	10.03
II	204	16.09	143,821	32.05
III	795	62.77	94,587	21.08
IV	219	17.20	136,585	30.43
V	--	--	28,760	6.41
Total -- Port-au-Prince	1,268	100.00	448,777	100.00

HEALTH MANPOWER

According to the World Health Organization, the occupational breakdown of global manpower in Latin America and the Caribbean shows the following pattern:

Physicians	6.9 per 10,000	(Haiti 0.6)
Nurses	2.3 per 10,000	(Haiti 0.89)
Auxiliaries	8.8 per 10,000	(Haiti 1.5)

It is evident from this that Haiti is even worse off than most of the Latin American countries. However, the proportion of nurses to physicians is a little better than in most other countries of the Region. It is, nonetheless, true here as elsewhere that the proportion of technical or pre-University personnel to university graduates is much too low. The World Health Organization states, "the deficiency at the middle level constitutes today the most serious manpower problem in Latin America and the Caribbean Area."* Training at intermediate levels in Haiti as elsewhere, lacks proper status.

In general it would seem that there is an urgent need for definition of functions and formal and informal mechanisms for the delegation of responsibilities, and for the exchange of tasks among personnel in different professional categories. It is essential that planning for manpower resources be considered an integral part of overall national health planning. Basic for this purpose is (1) the development of an adequate store of information on the available supply, utilization and training of health personnel; (2) clear definition of functions in the various occupations, and setting and reviewing of norms and standards. So far in Haiti the necessary analysis of the total health manpower situation is not available to permit the establishment of the best approach to adapting the health personnel to the epidemiological, socio-economic and administrative conditions of the country.

Analysis of the manpower situation in Haiti is made difficult by lack of official data. The most recent "Health Statistics" (June 1974) contains no information on health manpower apart from a rate of personnel per 10,000 population. The following discussion of manpower has been largely based on a publication by the Conseil National de Development et de Planification: Infrastructures, Sante Publique, Port-au-Prince, 1973 (Project HAI/SD-0970, Planification Physique, Habitation et Construction).

* Basic Reference Document, III Special Meeting of Ministers of Health of the Americas, Santiago, Chile, 1972.

Physicians

In 1973 there were (according to information published in 1973) 344 physicians in Haiti. It is known that 960 physicians graduated from the Medical School during the period 1928-1960. Of these, 28.6 percent remained in Haiti. In December 1972 the dean of the medical school stated that there were at that time about 600 Haitian physicians in the U.S., 300 in Canada, 200 in France, and 11 in England, with many working in U.N. agencies.

The distribution of physicians in the 9 departments of Haiti is given by the following table:

Departments	Physicians Number	Physicians Percent	Population (1971)	Physicians per 10,000
West	242	70.4	1,183,592	2.0
North-West	13	3.8	224,959	0.6
Artibonite	34	9.9	653,733	0.5
North	22	6.5	623,571	0.4
North-East	2	0.5	118,888	0.3
Grande-Anse	10	2.9	489,722	0.2
South	9	2.6	536,309	0.2
Central	4	1.1	321.583	0.1
South-East	8	2.3	352,732	0.2
TOTAL HAITI	344	100.0	4,505,089	0.8

Of the 242 physicians practicing in the Western Department, 235 are in the Port-au-Prince arrondissement. Distribution of physicians by arrondissement is given in Table 12. Note that in 3 arrondissements there are between 10-20 physicians, while in 19 others their number varies between 1-10. There are 4 arrondissements with 7 percent of the population that have no physicians at all. Taking into consideration an average production of 50 physicians annually, 60 percent emigration, and 5 percent loss for death and retirement, Haiti cannot expect many more than 500 physicians by 1980. The population in 1980 has been estimated at 5,459,659, giving a ratio of 0.9 physicians per 10,000 inhabitants.

A large proportion of the physicians work part-time for the Department of Health. The figure 280 has been given, but is difficult to establish since some physicians work only a few hours and not necessarily regularly. Most physicians in Port-au-Prince have some connection with the Department of Health, but derive their main income from private practice, as government salaries are very low.

One of the most serious problems is the marked imbalance in distribution of physicians, and particularly the fact that 235 of the physicians in the Western Department are found in the arrondissement of Port-au-Prince. Unfortunately, there is an equally unbalanced distribution of the rest of the health team. The productivity of the physician is hindered by shortages of nurses, particularly outside of the capital, and scarcity of other supporting staff.

The government has recently introduced an obligatory service in rural areas for students immediately after graduation from medical school before the right to medical practice will be given. While this may alleviate the situation somewhat, it is not likely to provide a satisfactory solution in itself. The general pattern of distribution of income is unlikly to change rapidly to bring experienced physicians or private practitioners into the civil service within reach of the rural population.

If the rural population is to receive their proper proportion of health services, which is the declared intention of the government, it will be necessary to redefine the responsibilities of physicians within the socio-economic context of the country. In the words of John Bryant in a recent book on the development of health services in what is now called the "third world," (Health and the Developing World, Cornell University Press, 1969):

> ...the health team must be seen as part of a process whereby needs are identified and resources are brought to bear on them, and among the most important resources will be the team members themselves. Since the needs will vary with time and place, there must be continuous reassessment of needs and programs and this will call for changing functions of the health team...
>
> ...The message for planners and educators is that the roles and education of individual members of the health team, professionals and auxiliaries, should be defined in terms of the team as a whole and the system for providing health care, and not as something isolated and apart.

The important point is that it should be clearly understood and accepted that the scarcity of money and physicians in rural areas means that the physician's role cannot be played at the village level; he cannot be personal physician for a community of 2-5,000 unless he neglects many times that number. As Bryant points out, we may assume that the young graduate is quite competent to handle clinical problems, but we should not expect him to be able to actually enter a community, assess its problems, set priorities and plan programs to meet them. The implication is that if young physicians are to take up the task of team-leader for the more effective utilization of paramedical and auxiliary personnel, they will need training for this purpose.

Dentists

It is somewhat difficult to say exactly how many dentists there are in Haiti. According to the "Infrastructures, Santé Publique" quoted earlier, the distribution is as follows (calculated from rates per 10,000):

Departments	Number	Population	Dentists per 10,000
Central	3	321,583	0.09
West	32	1,183,592	0.27
South	2	536,309	0.04
South-East	--	352,732	---
Grande-Anse	2	489,722	0.04
North	3	623,571	0.06
North-West	--	224,959	---
North-East	--	118,888	---
Artibonite	5	653,733	0.08
HAITI - TOTAL	47	4,505,089	0.10

More than two-thirds of the dentists are located in Port-au-Prince and work mostly part-time for the Department of Health. Three Departments are without any dental service.

Nurses

Haiti is fortunate in having a greater ratio of nurses to physicians (1.29 to 1) than the average for the region (0.3 to 1). However, this is far from a desirable figure. Even in a highly developed country 3 or even 4 to 1 would be considered a reasonable proportion. There are at the moment (1973) 445 graduate nurses in the country, giving a rate of 0.98 per 10,000 inhabitants. Of these, 60.4 percent work in Port-au-Prince, or 2.28 per 10,000 based on the population of the capital, leaving the rest of the country with 176 nurses or 0.52 per 10,000. Of the total nurses graduated since 1921, it is estimated that only one-third are working in the country, the rest having emigrated.

The number and distribution of nurses are given in the following table:

Departments	Number	Population	Nurses/10,000
Central	11	321,583	0.34
West	269	1,183,592	2.28
South	26	536,309	0.48
South-East	10	352,732	0.28
Grande-Anse	19	489,722	0.39
North	31	623,571	0.51
North-West	20	224,959	0.89
North-East	8	118,888	0.67
Artibonite	51	653,733	0.78
TOTAL - HAITI	445	4,505,089	0.98

The nursing situation in rural areas is highly unsatisfactory and will remain so until auxiliaries are used on a larger scale and more effectively. The situation is not unique to Haiti, however. The World Health Organization states in the above-mentioned "Basic Reference Document" from the Santiago meeting in 1972:

> It is anticipated that the already critical situation will become even worse due to lack of a planned approach in the determination of needs and the provision of resources to meet health program requirements. It is envisaged that the growing deficit will lead to greater confusion in the nursing picture, with increasing improvisation as to the use of types of nursing personnel in a last-minute effort to provide quantity.

Nursing Auxiliaries

"Infrastructures, Santé Publique" gives a figure of 737 nursing auxiliaries. As is the case with other categories of health manpower, it cannot be seen what year this refers to, but it would presumably be 1972. Up till 1968 only a fraction of the nursing auxiliaries had received any formal training. The number and distribution of the nursing auxiliaries were as follows:

Departments	Number	Population	Nursing Auxiliaries/10,000
Central	37	321,583	1.15
West	330	1,183,592	2.79
South	60	536,309	1.12
South-East	30	352,732	0.85
Grande-Anse	66	489,722	1.35
North	33	623,571	0.53
North-West	62	224,959	2.76
North-East	31	118,888	2.61
Artibonite	119	653,733	1.82
HAITI - TOTAL	737	4,505,089	1.63

Midwives

There is no statistical information available on the number of trained midwives. A certain number of nurses have participated in a post-basic two-year course offered for graduate nurses in obstetrics, which had 48 graduates in 1968. Practically all births in rural areas are attended by untrained village women, the so-called matrones. A recent survey carried out by SNEM found that there are about 11,000 matrones in rural areas. A number of proposals are under study for the short-term training of matrones, but without a reorganization of the rural infrastructure to permit continuous supervision of this type of auxiliary personnel, short-term training is unlikely to accomplish much.

Supporting Diagnostic and Treatment Personnel

Very little statistical information is available on this type of personnel. Such information as exists is outdated, but has been utilized for lack of more recent information.

Pharmacists

In 1967 there were 42 pharmacists and 7 pharmaceutical auxiliaries. There is a school of pharmacy at the University of Haiti which had 29 pharmaceutical students during 1967-68.

Laboratory Technicians

In 1970 there were 65 laboratory technicians working in hospitals and health centers. There is a National School of Laboratory Technicians with courses of two years' duration, from which 52 graduates were expected in 1970.

X-Ray Technicians

There were 32 X-ray technicians in Haiti in 1967.

Personnel Specialized in Public Health

A number of physicians working in the health department have received Master of Public Health degrees in the U.S. and Canada. There is a one-year post-basic course in public health nursing offered by the health department, from which 21 persons were graduated between 1963 and 1968.

Sanitation Personnel

There are a small number of sanitary engineers in Haiti. A fairly large number of Haitians have received training in sanitary engineering abroad, but are at this time working outside Haiti, many in PAHO/WHO. While there is no special division of sanitary engineering at the University, special attention is given to this subject during the second year of courses in civil engineering. In 1967 there were 123 "sanitarians," of which 78 were said to have received specialized training. There is no regular training for sanitarians in Haiti.

Health Statisticians

In 1970 there was only one health statistician with medium level training working in the Department of Health. At a somewhat lower level of training are: (a) one specialist in hospital statistics and medical records, and (b) 30 appointees without special training. At the local level, statistical work (enumeration, etc.) is entrusted to 87 auxiliaries (auxiliary nurses with some slight training in handling records).

Personnel Specialized in Medical and Hospital Care Administration

According to PAHO/WHO, in the Region of the Americas and the Caribbean, 70 percent or more of hospitals with over 100 beds are managed by staff without any special training in administration. There is no reason to believe that the situation in Haiti is better.

TRAINING OF PERSONNEL

Physicians

The first medical school was organized in Haiti in 1808; the first full medical faculty graduating physicians was ready in 1850. The medical school trains physicians, dentists and laboratory technicians. Among 700 applicants, 235 first-year students were accepted; 200 were medical students, 25 dental and 10 laboratory technicians.

About 35 percent of students drop out during the first year. Recently (since the early 1970's) 70-80 physicians have been graduated yearly. The size of the faculty and student body has been as follows:

Year	Faculty	Students
1944	25 teachers	100 students
1952	40	257
1971	70	750
1972	70	825

There have been 175-200 admissions annually to the medical faculty over the last few years, although 150 is considered the optimal number by the administration, with present accommodations and equipment. The salaries of faculty are extremely low, so that full-time teaching duties are out of the question. The Dean of the faculty receives $250 per month and the average remuneration of professors is $60 monthly. The low salary scale has led to specialization among the faculty, with each teacher offering only a few hours of classes. This has caused a fragmentation of the curriculum and is reflected in increasingly specialized questions in examinations. Recently examinations have been coordinated through a Central Committee of Medical Education which meets once or twice yearly.

A recent policy statement explains that given the particular conditions of the Republic of Haiti, the medical school must have two conflicting objectives which must nonetheless be combined: (1) The teaching must fit physicians to practice under the special socio-economic conditions existing in Haiti; particularly they must be able to handle the rural problems with an emphasis on prevention and community medicine; and, (2) they must at the same time be instructed adequately in modern scientific medicine as a basis for later advanced post-graduate training.

The teaching staff and administration are aware of a need for improvement of training in a number of supporting and administrative disciplines, which up till now have not received sufficient emphasis. There is a particular need for health administrators, managers and accounting specialists. So far no training has been offered to physicians in public health. A number of Haitian physicians have obtained this type of training abroad, and the possibility of organizing training in public health along the lines of the Puerto Rican School of Public Health has been discussed.

With the recently introduced obligatory services for physicians in rural areas, a project to conduct a number of courses for the students in these areas was organized, but had to be given up for logistic reasons -- particularly a lack of transport.

The Medical School has the following budget for 1973-74:

Medical and Pharmaceutical Faculty	US$87,949.00
Dental Faculty	US$39,771.00

All but US$2,176 of the funds available for the Medical and Pharmaceutical Faculty goes for salaries.

Dentists

There is a faculty of odontology at the University in Port-au-Prince which graduates an average of 6-8 dentists yearly. The program is traditional in nature and no attempt is made to prepare future dentists to organize and supervise the work of dental auxiliaries. The government has recently requested assistance in revising the training program. There are plans for having auxiliaries trained at the dental school, calling for 35 students and a 1-year course.

Nurses

Nursing training is offered at 3 nursing schools at the university level -- Port-au-Prince, Cap-Haitien and Les Cayes. These schools have a combined output of about 75 nurses annually. The training programs have tended to be rather traditional, emphasizing hospital nursing and not relating to the specific socio-economic problems of the country. This has been partly due to the fact that most of the teaching staff have had little or no rural experience. The training course is of three years' duration with the Baccalaureate (13 years with considerable mathematics and science) being an entrance requirement. Some students are admitted on the Brevet Superieur.

An attempt was made to set up some common courses for medical students and nurses at least in Port-au-Prince, but space and facility problems at the Medical School have so far prevented this. There has also been an attempt to introduce some community medicine in the curriculum, particularly through cooperation with HACHO. However, there is no budgetary provision for transportation, lodging and food for students.

Nurse Auxiliaries

A National School for Auxiliaries, the only school authorized for auxiliary training in Haiti, has been functioning since 1968. The course is of eight months' duration and runs from October to May. Five teachers have been appointed and other lecturers are invited occasionally. The basic salary of teachers is US$40 per month, actually $33 after taxes.

Women come from all over the country and it is estimated that 80 percent of them return to work in their own regions. Until now there has been a large number of candidates to choose from. The entrance requirement is ten years of schooling -- 3 years after the Certificat d'Etudes -- but candidates are applying with even higher levels of completed education.

The auxiliaries are trained to be polyvalent and are taught all the basic nursing techniques. Special attention is given to conducting a normal delivery, but basic sanitary procedures are also taught. The training offered is about one-third theory and two-thirds practice. The following numbers have graduated:

Year	Graduates
1969	48 (4 male)
1970	39
1971	50
1972	50 (1 male)

Midwives

There is no special school for midwives at a level comparable to that of nursing training. The Medical Faculty offers post-basic courses in obstetrical nursing of two years' duration which graduated 48 in 1968. Attempts are now being made to offer some training to untrained village women who attend almost all births in rural areas.

Maternal and Child Health and Family Planning

In 1962 a small Family Planning Association was founded with the assistance of the International Planned Parenthood Federation (IPPF), with activities in Port-au-Prince. In 1964 the government established the Department of Family Planning and in 1966 the Unitarian Service Committee (UUSC) supported a program integrating family planning into the activities of the MCH Center at the University Hospital at Port-au-Prince. The program was changed from urban to rural areas with the cooperation of the Family Planning International Association (FPIA) to become an interdisciplinary laboratory for community health, including maternity and child welfare and family planning. The Family Hygiene Center was thus opened in 1969 to combine small-scale development of economic activities. During 1969-71 this Center coordinated its work with the University Hospital MCH Center and extended its program to 3 villages. During 1969 and 1970 an area including 15,398 persons was covered in Port-au-Prince while the village population covered was 6,000. It was expected that this program would develop into a national family planning program.

From 1965 to 1971 the Albert Schweitzer Memorial Hospital and some church groups included family planning in their health programs. The Haitian American Community Help Organization (HACHO) also included family planning in its programs. Early in 1971 the government became concerned about the uncoordinated development of family planning programs and ordered all activities in this area to cease until the Department of Health could take over with full authority to establish standards and control all programs in MCH and family planning in the country.

In August 1971 a Division of Family Hygiene was organized within the General Directorate for Public Health Activities in the Ministry of Health and Population (FHD). This Division establishes policies governing maternal and child health and family planning services in the 11 sanitary districts. The FHD also collects and processes statistical information and advises the Director General of Health Services on matters pertaining to the coordination and supervision of relevant programs in the private sector.

In 1972 an agreement was signed between the Haitian government, PAHO/WHO and UNFPA for the execution of a 2-year project. The objectives of this agreement are to create an infrastructure for the conduct of integrated maternal and child health and family planning activities. In addition, provision was made for the operation of 2 mothers centers in order to study the feasibility of the service and to train personnel. As a result of the experience gained during the first 2 years of the project in the Port-au-Prince area, a new project has been submitted to various international agencies for consideration; its purpose is the gradual extension of the program to other districts in the country until national coverage is achieved. In order to facilitate the achievement of the objectives of this project, the Family Health Division is being strengthened.

The following MCH services were carried out in Port-au-Prince from March 1973 to March 1974.

		March/Dec. 1973	Jan./March 1974
I.	Pediatric		
	Consultations	1,482	5,312
	Umbilical Care	368	907
	Malnutrition		188
	Immunizations		
	BCG	713	806
	Tetanus	83	139
	DPT	554	4,919
	Anti-Typhoid		422
II.	Prenatal		
	Consultations	3,460	1,821
	Anti-tetanus vaccines	1,637	391
III.	Obstetrics		
	Deliveries	13,681	4,072
	F.P. Acceptors	933	302
	Percentage Acceptors	6.8	7.4
IV.	Family Planning	11,779	4,718
	Female	10,486	4,030
	Male	1,293	688
V.	Home Visits		21,777

(Source: Division of Family Hygiene Activities Reports (a) March to December 1973, and (b) January to March, 1974; Statistical service, Port-au-Prince)

The Family Hygiene Division's total program is to establish within 5 years, 40 integrated maternal and child health/family planning governmental clinics. It is envisioned that the Family Hygiene Division will continue to run two clinics already operating in Port-au-Prince, will open two additional ones in 1974 in Port-au-Prince, and 14 clinics in 1975 in the main District Hospitals. After this 10 clinics are to be opened every year until 40 have been set up.

The Family Hygiene Division has meanwhile created a planning committee for the establishment of norms, and a task force for supervision and inspection of governmental and private programs. It is intended to decentralize administration by the appointment of 3 regional directors.

Child Health

There are 33 pediatric clinics in 10 sanitary districts, of which 15 are private, 2 mixed, and 16 run by the government. The care offered nursing mothers and children is generally free and consists in health education with emphasis on nutrition, control of weight, general medical examination and vaccination (see table 15).

Chapter 5. NATIONAL HEALTH AND DEVELOPMENT PLANNING

Socio-economic planning is the responsibility of the National Council of Development and Planning (CONADEP) of which the President of the Republic is the titular head. Until 1973 he was represented by the Minister of Finance and Economic Affairs, who was also the Executive Secretary and represented the President on the main policy-making body, the National Council. This council included the Minister of Trade and Industry, the Minister of Agriculture and the President of the National Bank of the Republic of Haiti (DNRH).

In January 1974 CONADEP was reorganized and is now independent of the Ministry of Finance. The status of the Executive Secretary has been raised to that of Secretary of State and the National Council has been enlarged to include the Ministers of Education and Public Health and Population. The National Council is served by a technical secretariat, which has 5 divisions: documentation, economic and social planning, finance, foreign assistance and budgeting, and area development and environmental management. CONADEP has three nominal functions:

(a) long-run economic planning;
(b) preparation of the development budget;
(c) assistance to Ministries and semi-autonomous agencies in project preparation.

A Five Year Plan (1971-1976) was published in 1971, but has not been implemented or revised. CONADEP has indicated that another five-year plan is being prepared for the period 1976-1980.

One of the main difficulties in the work of CONADEP is said to be lack of effective formal communication with the planning and program units of governmental agencies and departments, where until quite recently no planning unit existed.

National health planning has been accepted by the Haitian government in accordance with general policy for the Region of the Americas and the Caribbean as agreed on at the Meeting of Ministers of Health of the Americas in Santiago, Chile in October 1972. Following this meeting, a Section for Planning and Evaluation was established in the Ministry of Health, and a Planning Committee was organized with a membership of senior Ministry officials. As one of the important preliminary steps to formulation of a national health plan, certain broad policy principles have been established as guidelines for future planning:

> Although Haiti is essentially an agricultural country and 80 percent of the population is living in rural areas, two-thirds of resources for health are concentrated in urban areas and particularly in the capital. In order to establish a more just distribution of the limited resources available to the Department of Health and to make it possible for the rural population to enjoy the fruits of socio-economic development, the government shall have to decentralize both administrative and technical services. This means regionalization.
>
> Such regionalization must permit: (1) a better distribution of the budgetary resources for health; (2) a more efficient supervision; and, (3) a more effective utilization of the resources.
>
> The region will be organized so as to be able to handle all health problems within its jurisdiction, except in quite exceptional cases, when it may have to call on the Central Department or the University Hospital. It will be constantly assisted by the technical divisions of the Central Department, which will play a purely normative role of supervision.

It is the intention to divide the Republic into five large medical regions. Each region will constitute a complete medical/public health system with a regional hospital, district hospitals, health centers and dispensaries.

The regional hospital will be equipped and furnished with a technical personnel enabling it to act as training center for the health staff of the region. The system will radiate from the regional hospital at the center via district hospitals to dispensaries becoming increasingly less complex and specialized.

In order to make the health services available to all inhabitants, it will be necessary to construct new buildings, improve and standardize equipment, renovate older buildings and make well-trained staff available.

The highest priority is the reduction of infant mortality and morbidity as well as the general mortality through the control of communicable diseases, improvement in environmental hygiene and campaigns against malnutrition.

A special effort will be made to associate the population with all the work of the Department since it is realized that without active and conscientious participation of the community progress cannot succeed. The community must therefore contribute within its ability to the different activities to be undertaken.

Methods for implementing this general policy are now under study in the Ministry. The Planning Committee will need technical as well as administrative support, which cannot be supplied by a Chief of Health Planning without proper staffing of his technical unit. A mission of the Interamerican Development Bank, in cooperation with PAHO/WHO, has been making a feasibility study and preparing a project for development of a health infrastructure for 3 geographic areas to which the government has assigned priority. It is now realized that any such development must be part of a general national health plan.

Chapter 6. HEALTH ASSISTANCE OFFERED BY INTERNATIONAL ORGANIZATIONS - BILATERAL ASSISTANCE AND ASSISTANCE OFFERED BY VOLUNTARY AGENCIES

The total contribution in the area of medicine and public health offered by multilateral, bilateral and voluntary agencies constitutes a very important part of the finances and technical expertise available for the Haitian health service system. There is a need for greater integration of outside assistance with government organizations in order to avoid duplication and ensure coordination. This is particularly true in the case of large-scale bilateral aid.

MULTILATERAL ASSISTANCE

World Health Organization/Pan American Health Organization (WHO/PAHO)

Operating under a basic agreement with the Government of Haiti, WHO/PAHO has been providing a wide range of technical services in 5 main areas: strengthening of health services, family health, health manpower development, communicable disease prevention and control, and health statistics.

1. Communicable Disease Control - This program, organized in 1973, aims at eradicating yaws by 1975, improving case detection measures for leprosy in rural areas, and applying recently developed methods of control of other communicable diseases, and reorganizing the structure of epidemiological and communicable disease control services to make them more closely integrated.

2. Malaria Eradication Program - This program has been operating since 1961 with support from USAID and UNICEF, and has been described above. UNICEF is now withdrawing its support of this project.

3. Veterinary Public Health - Set up in 1973, this project will establish a veterinary section that, in conjunction with the Ministry of Health, will be able to determine the extent of the zoonoses problems and draw up control procedures.

4. Engineering and Environmental Sciences - A program of latrine construction was started in Mirebalais and neighboring localities in 1971 and is scheduled to finish in 1975.

5. Water Supplies - A project has been operating since 1960 to improve the water supply system of the metropolitan area of Port-au-Prince and the systems of other urban and rural areas.

6. Health Services - In collaboration with the Organization of American States and UNICEF, a project was started in 1957 to develop integrated public health services at national and local levels, establish a demonstration area in Les Cayes, and train health personnel. This program is scheduled to be concluded in 1975.

7. Public Health Services - Together with UNDP, an experimental system of public health services was begun in Les Cayes in 1972.

8. Nutrition - In collaboration with the Pan American Health and Education Foundation, UNICEF, FAO and UNESCO, a project was organized in 1961 to improve the nutritional status of the population through nutrition education, supplementary feeding programs for vulnerable groups, and other measures. Further, the project was to develop an integrated food and nutrition program in certain rural areas. This program is scheduled to run through 1976.

9. Health and Population Dynamics - In collaboration with the United Nations Fund for Population Activities, a project was started in 1970 to develop an integrated maternal and child health and family planning program. This program is currently being reorganized.

10. Development of Human Resources - A project was established in 1968 to improve physical facilities, educational programs, and the examination system of the Faculty of Medicine.

11. Nursing Education - A program to improve the teaching in nursing schools and training of nursing auxiliaries has been in effect since 1968.

12. Sanitary Engineering Education - A program was started in 1971 to improve teaching of sanitary engineering and laboratory and library facilities at the School of Science of the University of Haiti.

During 1959-72, PAHO was carrying out a program to strengthen health laboratories. The central laboratory was reorganized and administrative guidelines were drawn up for its various sectors (1961-63). Under this program applied research was carried out on brucellosis, tropical ulcer,syphilis serology, tuberculosis and leptospirosis. An animal colony was added in 1962-63. During 1963 and 1964 reorganization and expansion of central laboratory services were continued, a research program on enteric bacteriology completed, and the School of Technology prepared a manual on laboratory methods. An advisory committee was set up in 1966 to review guidelines for the central laboratory and determine needs for equipment and new laboratories. In 1967 construction of the central laboratory was improved and the capacity of the General Hospital's laboratory was extended. Laboratory materials were provided to 22 health establishments. In subsequent years periodic revisions were made of laboratories in operation and their capacity was progressively expanded.

The budgetary provisions for WHO/PAHO are estimated as follows:

	U.S. Dollars			
Source	1974	1975	1976	1977
Regular WHO Budget	92,595	104,731	113,555	119,280
Other Sources (PAHO, UNFPA, UNDP, etc.)	913,373	1,709,544	1,641,797	1,645,828
TOTAL	1,005,968	1,814,275	1,755,352	1,765,108

It should be noted that a large proportion of this proposed budget is from UNFPA for the Health and Population Dynamics program:

1974: 462,390

1975: 1,191,574

1976: 1,192,178

1977: 1,193,178

Interamerican Development Bank

In health, the IDB has been dealing principally with the improvement of water supply systems as described in Chapter 2. During the first half of 1974 a mission made a feasibility study and prepared a project for the development of the health infrastructure of 3 health districts to which the government assigns priority. This mission was carried out in collaboration with PAHO.

BILATERAL ASSISTANCE

United States Agency for International Development (USAID)

The AID program in Haiti is targeted to the rural population, with an emphasis on agriculture. The oldest health program relates to communicable diseases, and specifically to the control of malaria. The malaria activities began in 1961, consequent to a quatripartite agreement between the Government of Haiti, WHO/PAHO, and UNICEF. In 1974 the title of the program was modified to Communicable Disease Control, but to date the principal activities are still related to malaria control. Approximately $20 million of USAID funds have been channeled to this project over 14 years.

The Rural Community Development Program, initiated in 1966, resulted in the development of a comprehensive program operated through the Haitian American Community Help Organization (HACHO). Included in this program are the operation of 10 nutrition centers providing maternal and child health services and projects for the installation of water systems. Approximately $2.5 million has been expended for HACHO; however, the portion directly applicable to health is not available.

AID has recently authorized a project for Maternal and Child Health and Family Planning which will provide $529,000 for construction of training centers, training, operation of two clinics, and supervision costs. The project is coordinated with a larger multi-donor program in support of MCH/FP activities of the Division of Family Hygiene of the Ministry of Public Health and Population. The principal donor will be the United Nations Fund for Population Activities, which has already allocated $1,666,000 of an estimated $5 million. Additional assistance is expected to be forthcoming from Pathfinder and WFP. The program would develop a service network providing coverage for 925,000 people in the first phase, and an additional 500,000 in the second phase - roughly one-third of the Haitian population in total.

DEVELOPMENT ASSISTANCE IN THE FIELD OF HEALTH OFFERED BY NON-PROFIT U.S. ORGANIZATIONS IN HAITI

There are a large number of U.S. voluntary agencies, missions, foundations and other non-profit organizations which provide the people of Haiti with material aid and assistance in the field of medicine, public health, education, and community development. Not all of these organizations have provided financial data, but from the data provided by 22 agencies it is known that these agencies have spent a total of US$4,611,930 in 1973. A summary of the most important assistance will be given below.

American Baptist Churches in the U.S.

This organization staffs and operates the Good Samaritan Hospital at Limbe, which has a 20-bed maternity ward, a 45-bed pediatric ward, and a dispensary treating approximately 4,000 outpatients a month. A food distribution and feeding program, and a family planning clinic, are conducted through the hospitals and schools.

American Women's Hospitals Service

This Service supports the Limbe dispensary and a rural mobile clinic which works from Limbe and provides nutrition, hygiene, health education and innoculations in a program of disease prevention. The organization also provides family planning services on request.

CARE, Inc. (Cooperative for American Relief Everywhere)

CARE provides administrative and material assistance including PL-480 food to the Haitian American Community Help Organization (HACHO) for rural development projects. CARE also conducts curative and preventive health programs and environmental sanitation projects in collaboration with HACHO.

Catholic Medical Mission Board, Inc.

During 1972, 22 medical volunteers and medical goods valued at US$323,271 were sent to applicants operating medical facilities throughout Haiti.

Catholic Relief Services - United States Catholic Conference

CRS provides U.S. Government-donated foods for food-for-work projects. This organization, Secours Catholique D'Haiti, and the government Bureau of Nutrition, conduct a nutrition education program designed to educate mothers and rehabilitate children suffering from malnutrition. The work is carried out in five nutrition centers constructed with OXFAM funds. The organization also assists a four-year immunization program organized by the Family Health Division of the Ministry of Health and supported by OXFAM for the vaccination of pregnant women against tetanus, and of preschool children against diptheria, whooping cough, tetanus, and tuberculosis.

Christian Medical Society, Medical Groups Mission

This organization provides teams consisting of physicians, surgeons, nurses,dentists, and support personnel to work in rural areas. Teams are based in hospitals and missions of the Unevangelized Fields Mission near Port-de-Paix and the CMS International hospital in Cap-Haitien.

Church of the Brethern General Board (World Ministries Commission)

This group provides financial assistance to the Aide aux Enfants program for preschool children in Port-au-Prince. The program consists of clinical care and supplemental feeding for approximately 4,500 children per month.

Church of the Nazarene

This organization operates a dispensary at Freres.

Church World Service

CWS conducts an immunization program at Gonave.

Churches of God in North America, Inc.

This organization operates school lunch programs providing one balanced meal a day, and two nutrition centers where children receive protein-rich foods and their mothers are given instruction in its preparation.

Direct Relief Foundation

This Foundation's activities include shipping pharmaceuticals, medical supplies and hospital equipment to hospitals and clinics in Haiti.

The Episcopal Church of the U.S.

This Church group staffs and operates dispensaries at Gros Morne, Fonds-Parisien, Ile de la Tortue, Montrouis, and Port-au-Prince. It also operates a dispensary attached to the Holy Trinity School in Port-au-Prince.

Focus, Inc.

This group operates an ophthalmological clinic and eye surgical service at the General Hospital in Les Cayes.

The Ford Foundation

In FY 1972 the Ford Foundation provided US$50,000 to the Haitian Center for Research in the Social Sciences (CHISS) in Port-au-Prince for research on urbanization. In FY 1973 a grant of US$70,000 was made to CHISS to investigate women's attitudes toward family planning and evaluate the government's family planning and child care project.

Free Methodist Church of North America

This organization operates a clinic in Port-au-Prince. In 1972, it provided US$1,550 for medicine and public health, and in 1973 it provided US$1,650.

(Sisters of) Holy Cross and of the Seven Dolors

This group operates a hospital in Pilape and clinics in Le Borgne and Milot. It also assists in the staffing of a Red Cross clinic in Port-au-Prince.

International Committee Against Mental Illness

This group contributes psychoactive drugs to mental health programs in Haiti.

The International Eye Foundation

This foundation operates a Fellowship Program whereby senior residents of Yale University's School of Medicine, Department of Ophthalmology, are sponsored for 3-month assignments at the Albert Schweitzer Hospital, working in the outpatient clinic. The residents are aiding Haiti in establishing eye banks where necessary, and training local doctors and nurses in modern eye health care. The foundation also operates a "Visiting Professors and Surgeons Program" in which senior men in the field of ophthalmology periodically visit Haiti where they lecture, demonstrate the latest surgical techniques, and guide the Fellows in their work.

Mennonite Central Committee

This group conducts an outpatient program in cooperation with the Hospital Grande Riviere du Nord, with 40-45,000 consultations a year. It also conducts an expanding public health program with a corps of rural health officers.

Missionary Church, Inc.

This organization operates a 15-bed maternity hospital near Pignon in central Haiti, with a clinic and 2 outstation clinics. Approximately 20,000 patients were treated during 1972.

Oblates of Mary Immaculate

Maintains 13 dispensaries staffed by nuns and local personnel.

OMS International Inc.

Formerly the Oriental Missionary Society, Inc., this group operates a clinic in Cap-Haitien which treated approximately 24,000 patients in 1972.

Presbyterian Church in the United States, General Executive Board

Cooperates with the Episcopal Church of Haiti in medical care in church hospitals in Leogane and in 5 rural clinics nearby.

Public Welfare Foundation

In 1973 provided a grant of US$5,000 for general support to the Albert Schweitzer Hospital in Deschapelles.

Reorganized Church of Jesus Christ of Latter Day Saints

Operates health teams which provide medical and dental treatment in rural areas. Teams consist of physicians, dentists, nurses, and paramedical personnel serving on a short-term basis. Also provides medical and dental supplies and sponsors two mothercraft nutrition centers.

Research Corporation

Made a 5-year grant of US$99,300 supporting evaluation of the effectiveness of mothercraft centers, as an integral part of the community health program of the Albert Schweitzer Hospital aimed at the prevention of malnutrition in the preschool child (1972).

Salesians of St. John Bosco

Operates one clinic.

The Salvation Army

School feeding programs at schools in Fonds des Negres, Aguina, Port-au-Prince, La Ferronnay, Couyau, Gros Morne, Moulin, Mapou, are operated by this organization. The Salvation Army has dispensaries and first-aid programs in Fonds des Negres, Gros Morne, Moulin, Couyau, Archaic, Aguin, and La Ferronnay.

Unevangelized Fields Mission

Staffs and operates a hospital and a House of Hope for crippled children at La Pointe, Port-au-Prince.

United Methodist Committee on Relief

Operates a food-for-work program which includes building roads, landscaping, and improving water supply. Operates a dental health program in Jeremie and provides dental and medical equipment.

The Wesleyan Church

Operates a hospital on La Gonave Island with 3 rural clinics treating 25,766 patients.

West Indies Mission, Inc.

Sponsors food-for-work programs with emphasis on well and road construction, and improvement of water supply in the rural area around Les Cayes. Also operates one central dispensary in Les Cayes and 4 rural clinics in the surrounding area. Provides birth control information and medication in Les Cayes.

TABLES AND ILLUSTRATIONS

Table 1. AGE AND SEX STRUCTURE OF THE POPULATION
(thousands and percent)

Age	Males	Percent	Females	Percent	Total	Percent
Less than 1	73.3	1.7	76.4	1.8	149.7	3.5
1 - 4	230.4	5.3	226.1	5.3	456.5	10.6
5 - 9	292.1	6.8	296.8	6.9	588.9	13.7
10 - 14	300.3	7.0	294.3	6.8	594.6	13.8
15 - 19	229.5	5.3	250.3	5.8	479.8	11.1
20 - 24	152.3	3.5	181.2	4.2	333.5	7.7
25 - 29	131.2	3.0	167.0	3.9	298.1	6.9
30 - 34	103.1	2.4	126.4	2.9	229.5	5.3
35 - 39	121.2	2.8	147.6	3.4	268.8	6.2
40 - 44	104.8	2.4	109.2	2.5	214.0	4.9
45 - 49	94.5	2.2	90.2	2.1	184.7	4.3
50 - 54	70.8	1.6	66.0	1.5	136.8	3.1
55 - 59	45.3	1.1	44.0	1.0	89.3	2.1
60 - 64	46.6	1.1	48.3	1.1	94.9	2.2
65 - 69	33.2	0.8	37.1	0.9	70.3	1.7
70 - 74	22.4	0.5	28.0	0.7	50.5	1.2
75 - 79	13.8	0.3	18.1	0.4	31.9	0.7
80 - 84	8.6	0.2	12.5	0.3	21.1	0.5
85 and over	7.3	0.2	14.2	0.3	21.6	0.5
TOTAL	2,080.9	48.2	2,233.7	51.8	4,314.6	100.0

Source: 1971 Population Census, Haitian Statistical Institute

Table 2. GROWTH OF THE URBAN POPULATION BY ARRONDISSEMENT FROM 1950 TO 1971

Arrondissement	Urban Population 1950	1971	Growth in Percent
Port-au-Prince	151,918	506,525	233.4
Gonaives	17,862	36,736	105.7
Hinche	7,621	14,221	86.6
Jeremie (grde anse)	15,720	25,117	59.8
Jacmel	12,485	16,449	31.7
Anse-a-Veau (Nippes)	6,002	9,727	62.0
Mole St. Nicolas	2,683	4,391	63.7
Aquin	5,727	5,265	8.1
St. Marc	11,375	20,504	80.2
Belle-Anse (Saltrou)	2,187	3,040	39.0
Port-de-Paix	10,808	21,733	101.1
Dessalines	8,936	13,324	49.1
Fort Liberté	12,167	12,869	5.8
Cayes	15,817	27,222	172.1
Vallieres	1,886	3,537	87.0
Mirebalais	4,174	7,080	69.6
Leogane	10,846	16,718	54.1
Lascahobas	3,401	5,339	56.9
Marmelade	3,104	5,765	87.2
Limbé	3,190	6,502	66.3
Coteaux	7,694	9,687	25.9
Tiburon	5,538	13,029	135.3
Cap-Haitien	29,399	54,691	86.0
Gde Riviere du Nord	9,137	16,101	72.8
Trou du Nord	11,919	14,387	20.7
Borgne	3,338	5,735	71.8
Plaisance	2,972	4,014	35.1
TOTAL	378,806	879,708	132.2

Source: Institute Haitien de Statistique, Resultat Preliminaire du Recensement General Septembre 1971. Septembre, 1973.

Table 3. GROWTH OF THE RURAL POPULATION BY ARRONDISSEMENT FROM 1950 TO 1971

Arrondissement	Rural Population 1950	1971	Growth in Percent
Port-au-Prince	261,859	370,750	41.5
Gonaives	147,854	150,100	1.45
Hinche	95,675	119,320	23.4
Jeremie (gde anse)	159,645	215,740	35.1
Jacmel	233,221	282,610	36.4
Anse-a-Veau (Nippes)	135,846	140,600	3.5
Mole St. Nicolas	49,808	75,690	51.8
Aquin	118,186	155,360	31.4
St. Marc	85,250	127,050	49.0
Belle Anse (Saltrou)	54,725	49,200	minus 10.0
Port-de-Paix	104,980	114,690	9.3
Dessalines (Marchand)	111,157	161,260	45.1
Fort Liberté	52,190	56,010	7.3
Cayes	179,366	245,430	37.0
Vallieres	41,436	44,340	7.0
Mirebalais	109,957	119,400	8.6
Leogane	200,142	257,830	28.8
Lascahobas	38,154	34,750	minus 8.9
Marmelade	72,307	107,580	48.8
Limbé	35,683	30,030	minus 15.8
Coteaux	48,546	76,700	58.0
Tiburon	41,515	48,910	17.8
Cap-Haitien	88,786	145,120	63.4
Grde Riviere du Nord	97,136	84,330	minus 13.2
Trou du Nord	40,362	54,940	36.1
Borgne	54,287	74,530	37.3
Plaissance	54,261	92,750	70.9
TOTAL	2,713,334	3,434,920	26.2

Source: Institut Haitien de Statistique, Resultat Preliminaire du Recensement General Septembre 1971. Septembre, 1973.

Table 4. POPULATION DENSITY BY GROUPING

Population Densities	Number of Locations	Numbers in Thousands	Percentage
Greater than 100,000	1	494	11.4
20,000 to 99,999	3	97	2.2
10,000 to 19,999	4	60	1.4
2,000 to 9,999	36	130	3.0
500 to 1,999	69	76	1.8
Less than 500	--	3,458	80.2
TOTAL		4,315	100.0

Source: Haitian Institute of Statistics, 1971 Census, September 1973.

Table 5. SLIDE POSITIVITY RATES, 1962-1974

Year	Slides Examined Total	Positives Number/Year	Positives No./Jan-June	SPR
1962	87,484	2,997		3.4
1963	379,717	6,340		1.7
1964	473,479	19,160		4.0
1965	752,284	10,304		1.4
1966	2,239,469	8,378		0.4
1967	1,343,796	4,871	3,070	0.4
1968	1,169,359	2,559	1,507	0.21
1969	686,167	5,005	1,890	0.73
1970	358,349	10,661	4,282	3.09
1971	270,288	11,316	2,914	4.2
1972	313,368	25,961	7,644	8.3
1973	309,482	22,858	8,776	7.6
1974*	163,399*		13,361	8.2

* January - June

SPR = Slide Positivity Rate

Source: SNEM

Table 6. SUMMARY NUTRITION TABLES

References	Locality	Type of Population	Consumer Days	Calories (cal.)	Proteins (total-g)
Haitien Inst. Stat. 1951 /1/	Different	Urban Rural	2,675	2,450 1,491	82 70
Boulos 1954 /2/	Paup La Saline	Urban	1,134	2,096	45.4
Cesar 1955 /3/	Portail Leogane	Urban	119	2,236	--
Grant & Groom 1958 /4/	La Saline Paup	Urban	572	1,383	40
Sebrell & coll 1959 /5/	Entire Country	Urban Rural	460	1,580	37.4
Beghin & coll 1962 /6/	Port Larget	Rural	900	1,105	26.8
Dominique & coll 1968 /7/	Fond Parisien	Rural	2,343	1,360	31.7
Dominique & coll 1968 /8/	Ganthier	Rural	1,927	1,524	36.1
Dominique 1965 /9/	Fond Parisien	Rural	214	1,580	40.4
Dominique 1965 /10/	Guerin	Rural	2,387	2,203	55.8
				2,200*	55-60*
Average of above				1,728	39.2
Dominique 1965				1,670	41.3
Beghin, Fougere, King Estimation from 2 above				1,700	40.0

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/6/ Dominique, Gladys, 1965:
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/7/-/8/-/9/-/10/
(a) Dominique, Gladys, Uriodain, G., Fougere, W., and King, K.W., 1968:
Food Patterns in rural Haiti
Archives Latioamericanos de Nutrition, 17.

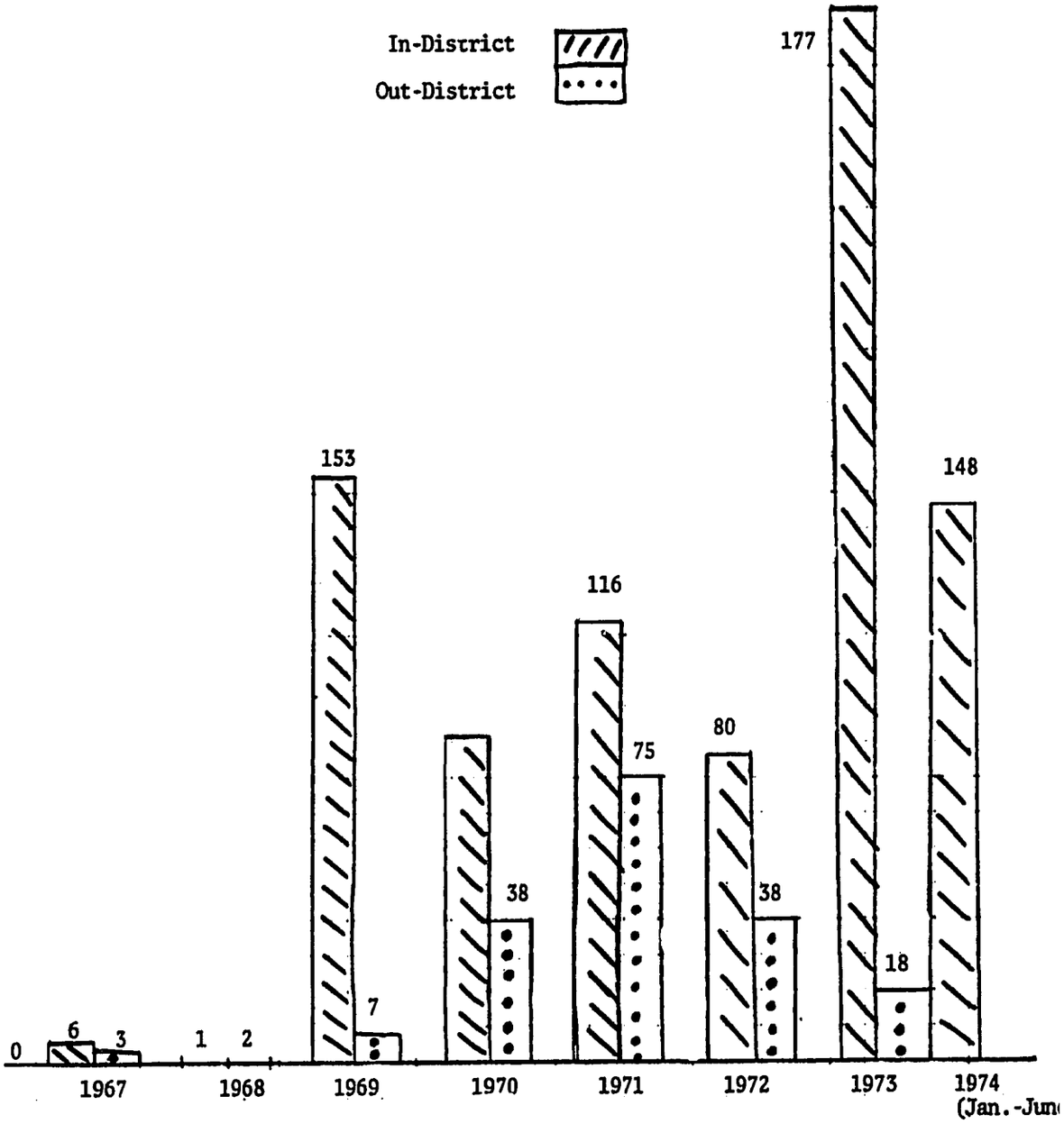
(b) Same: 1968: Food patterns in rural Haiti
J.A.D.A. (in press)

* F.A.O. Normal Figures proposed for 7 LA countries

Calories	2,200
Total Protein	60 g.
Animal protein	7 g.

Figure 1

Cases of Malaria In and Out-District Diagnosed at Albert Schweitzer by Year



Source: SNEM

Table 7. FOOD CONSUMED IN HAITI EXPRESSED IN KILOGRAMS PER PERSON PER YEAR

PRODUCT	USDA '59-'61	SEBRELL 1959	DOMINIQUE 1965	OEA/CEPAL/ ILO 1962	OTHERS	NEW EST. FOUGERE
CEREALS						
Wheat	6.0	16.4	2.0	-	-	6.0
Corn	18.5	23.0	28.3	53.2	36.7	29.0
Rice	6.0	7.0	22.0	7.8	6.0	9.0
Millet, sorghum	31.8	9.9	11.3	42.8	29.3	19.0
Other	0.7	-	-	-	-	-
TOTAL	63.0	56.9	63.6	103.8	72.0	63.0
ROOTS, TUBERCLES						
Potatoes	21.1	-	-	0.2	-	0.2
Sweet potatoes	31.7	-	14.3	19.8	-	21.9
Manioc	74.3	-	18.0	26.3	-	39.0
Yam	1.7	-	8.5	4.8	-	5.0
Other	-	-	-	3.3	-	3.3
TOTAL	128.8	64.3	40.8	54.4		69.5
SUGAR AND SYRUPS						
Sugar	12.7	-	-	-	11.7	11.7
Rapadou	-	14.6	6.5	-	-	14.6
Sugarcane	-	-	40.5	-	-	40.5
TOTAL	12.7	14.6	47.0		11.7	66.8
LEGUMES, OIL, NUTS						
Peas and Beans	18.6	11.0	19.8	8.8	11.3	19.0
Ground nuts	5.5	0.6	-	0.6	0.5	0.0
Cashew nuts	14.2	-	-	4.5	7.8	6.0
TOTAL	38.3	11.6	19.8	13.9	19.6	25.0

Source: Fougere, op. cit.

Table 7 (cont'd.) FOOD CONSUMED IN HAITI EXPRESSED IN KILOGRAMS PER PERSON PER YEAR

PRODUCT	USDA '59-'61	SEBRELL 1959	DOMINIQUE 1965	OEA/CEPAL/ ILO 1962	OTHERS	NEW EST. FOUGERE
VEGETABLES						
Vegetables, greens	29.6	-45.6	40.0	0.7	13.0	43.0
FRUIT						
Bananas	-	-				9.0
Plantain	-	36.5	20.5			36.5
Total	45.9					45.5
Mangoes		63.0	1.5	24.0	50.0	60.0
Avocado		13.5	0.7	0.8	2.5	15.0
Citrous		-	-	-	1.6	15.0*
Total	106.3					100.0
TOTAL ALL FRUIT	152.2	113.0	22.7	24.8	54.1	145.5
MEAT						
Beef and Veal	2.4	-	3.8	2.5	-	2.7
OTHER	6.7	-	2.5	1.5	-	4.6
Chicken		-	-	0.7	-	0.7
TOTAL	9.1	8.0	6.3	4.7	-	8.0
EGGS						
Egg	2.4	-	-	1.0	-	0.9
FISH						
Fresh	-	-	-	-	1.1	1.1
Dried	-	-	-	-	0.7	0.7
TOTAL	4.6	2.5	1.8	-	1.8	1.8

* Other 1

Table 7 (cont'd.) FOOD CONSUMED IN HAITI EXPRESSED IN KILOGRAMS PER PERSON PER YEAR

PRODUCT	USDA '59-'61	SEBRELL 1959	DOMINIQUE 1965	OEA/CEPAL/ ILO 1962	OTHERS	NEW EST. FOUGERE
MILK etc						
Whole milk	8.4	3.1	15.3	7.0	-	-
Skinned milk	0.3					
TOTAL	8.7	3.1	15.3	7.0		11.0
CHEESE						
Cheese	0.2			0.2		0.2
FATTY SUBSTANCES						
Cotton seed		3.3			6.9	5.0
Other veg. oils	1.4			0.8		
Butter					2.2	1.5
Lard	1.9			1.0		
TOTAL	3.3	3.3		1.8	9.1	6.6
DIVERSE						
Clairin						7.5
Rum						0.1
Cacao				0.5		0.5
Coffee						2.5
TOTAL				0.5		10.6

Table 8. THE ORIGIN OF PROTEIN, FATTY SUBSTANCES AND CALORIES IN HAITIAN NUTRITION

PRODUCT	PER YEAR KG.	PER DAY		
		CALORIES	PROTEIN (Gram)	FAT (Gram)
General Total	425.5	1700	41.0	37.0
Cereals	-63.0	617	16.9	5.6
Wheat	6.0	60	1.9	0.2
Corn	29.0	289	7.6	3.4
Rice	9.0	89	2.0	0.3
Sorghum	19.0	179	5.4	1.7
Roots, Tubercles	69.5	191	1.5	0.4
Potatoes	0.2	1	0.0	0.0
Sweet potatoes	21.9	54	0.6	0.1
Manioc	39.0	116	0.6	0.2
Yams	5.0	11	0.2	0.0
Other	3.3	9	0.1	0.1
Sugar, syrups	-	300	0.0	0.0
Sugar	1.7	124	0.0	0.0
Rapadou	14.6	133	0.0	0.0
Sugar Cane	40.5	43	0.0	0.0
Legumes, nuts etc.	-	116	11.3	3.6
Beans	19.0	79	10.6	0.2
Groundnuts	0.6	6	0.3	0.5
Cashew	6.0	31	0.4	2.9
Vegetables	43.0	35	1.3	0.0
Fruit	145.5	184	1.9	2.9
Bananas	9.0	16	0.2	0.0
Plaintain	36.5	75	0.6	0.2
Mangos	60.0	48	0.4	0.2
Avocado	15.0	28	0.4	2.5
Citrous	15.0	10	0.2	0.0
Others	10.0	7	0.1	0.0

Source: Fougere, op. cit.

Table 8 (cont'd.)

THE ORIGIN OF PROTEIN, FATTY SUBSTANCES AND CALORIES IN HAITIAN NUTRITION

PRODUCT	PER YEAR KG.	PER DAY CALORIES	PROTEIN (Gram)	FAT (Gram)
Meat	8.0	50	3.7	3.8
Beef, veal	2.7	18	1.4	1.3
Chicken	0.7	5	0.3	0.4
Other	4.6	27	2.0	2.1
Eggs	0.9	3	0.3	0.2
Fish	1.8	9	0.3	0.3
Fresh	1.1	3	1.9	0.1
Dried	0.7	6	0.5	0.2
Milk	-	20	1.2	1.0
Milk	11.0	18	1.1	0.9
Cheese	0.2	2	0.1	0.1
Fatty Subst.	6.6	125	0.0	17.7
Cotton oil	5.1	125	0.0	14.0
Other	1.5	-	0.0	3.7
Diverse	-	20	1.0	1.5
Clairin	7.5	-	-	-
Rum	0.1	-	-	-
Cacao	0.5	5	0.1	0.5
Coffee	2.5	15	0.9	1.1

Table 9. PRODUCTION OF PRINCIPAL AGRICULTURAL COMMODITIES
M.T. EXCEPT WHEN OTHERWISE INDICATED (000's)

	1950 (1)	1960 (1)	1966 (2)	1968 (2)	1969 (2)	1970 (1)	1970 (2)	1971 (3)
Corn	205.8	226.9	234.0	220.0	242.0	235.0	240.0	252.0
Sorghum	173.9	182.7	187.0	189.0	209.0	150.0	210.0	211.0
Rice	41.8	50.4	76.0	77.0	83.0	50.0	80.0	81.0
Beans	34.2	37.0	41.0	36.0	40.0	40.0	40.0	42.0
Panama (Plantain)	25.3	32.5	17.0	13.0 (174)	14.0 (189)	39.0	14.0 (189)	14.0 (190)
Manioc	104.3	109.6	111.0	111.0	121.0	130.0	130.0	134.0
Potato (sweet)	79.4	83.3	6.4	6.6	7.4	70.0	6.6	7.0
Sugar Cane	4185.0	4952.0	4952.0	4300.0	4600.0	3500.0	4800.0	4900.0
Coffee	34.9	38.9	34.9	31.6	30.2	36.7	27.2	32.6
Cocoa	3.2	3.9	2.5	2.5	2.5	2.7	2.0	2.9
Sisal	33.7	26.6	27.0	19.0	17.0	18.0	17.0	18.0
Cotton	5.6	3.5	3.0	1.0	1.3	4.0	1.8	3.0
Tobacco	0.9	1.9	2.0	1.9	2.2	2.0	2.2	2.2
Livestock	---	---	---	---	---	---	---	---
Fish	---	---	---	---	---	---	---	---
Other Agriculture	---	---	---	---	---	---	---	---

(1) From IDB/FAO 1974 Report
(2) From IBRD 1972 Report - these figures are used by CONADEP
(3) From IMF 1973 Report
(4) From unpublished data IICA
(5) From unpublished data by IICA

Table 9 (cont'd.)

	1972 (3)	1973 (4)	Yields IICA	Kg/Ha FAO/IDB
Corn	265.0	257.0	1076.0	750.0
Sorghum	217.0	215.2	981.0	750.0
Rice	92.0	82.6	2118.0	2000.0
Beans	47.0	42.8	520.0	600.0
Banana (Plantain)	195.0	206.6	2387.0	1360.0
Manioc	141.0	---	---	5000.0
Potato (sweet)	7.2	---	---	2000.0
Sugar Cane	5057.0	4900.0	59.8 MT	10.0 MT
Coffee	32.4	33.3	250.0	230.0
Cocoa	3.1	3.3	323.0	---
Sisal	20.0	---	---	---
Cotton	3.0	5.4	242.0	600.0
Tobacco	2.3	---	---	650.0
Livestock	---	---	---	---
Fish	---	---	---	---
Other Agriculture	---	---	---	---

(1) From IDB/FAO 1974 Report
(2) From IBRD 1972 Report - these figures are used by CONADEP
(3) From IMF 1973 Report
(4) From unpublished data IICA
(5) From unpublished data by IICA

Table 10. PRODUCTION OF PRINCIPAL AGRICULTURAL COMMODITIES
M.T. EXCEPT WHEN OTHERWISE INDICATED (000's)

	Relative Importance Expressed as % of Total Agriculture		
	Area	Value	Labor Employed
Corn	20.4	13.2	22
Sorghum	18.8	4.0	8
Rice	3.3	12.6	4
Beans	7.0	6.8	7
Banana (Plantain)	7.4	8.3	8
Manioc	---	---	--- (6)
Potato (sweet)	---	---	--- (6)
Sugar Cane	7.0	7.9	8
Coffee	11.4	12.0	12
Cocoa	.9	1.0	1
Sisal	---	---	---
Cotton	1.9	.5	3
Tobacco	---	---	---
Livestock	---	12.3	---
Fish	---	2.1	---
Other Agriculture	21.8	18.6	26
TOTAL	100.0%	100.0%	100%

(6) Included in "Other Agriculture"

NOTE: Sub-totals may not equal totals because of rounding.

Table 11. VARIOUS MONTHLY WAGES, (U.S. DOLLARS)

	HACHO	SNEM	MOHP	FHD
Director	627.00	600.00	400.00	550.00
Assistant Director	250.00			700.00
Chief Evaluation Unit		450.00		550.00
Statistician		175.00		200.00
Regional Director (MD) CD	250.00	550.00		370.00
Auxiliary Statistician		130.00		175.00
Secretary	115.00	140.00	100.00	150.00
Secretary to the Director	150.00	170.00		175.00
Chief Administrator		380.00	300.00	300.00
Storekeeper		160.00		175.00
Driver	70.00	75.00		85.00
Assistant Storekeeper		130.00		150.00
Janitor	39.00	55.00		40.00
Educator		144.00		275.00
Chief of Any Section		320.00	210.00	
Night Watchman	30.00	55.00		40.00
Chief Mechanic	115.00	200.00		
Senior Mechanic	90.00	130.00		
Receptionist	90.00	150.00		
Garage Dispatcher/Controller	150.00	220.00		
M.D.	215.00		140.00	175.00
Dentist	175.00			
Infirmier(e)	100.00		130.00	150.00
Auxiliary Infirmier(e)	70.00			
Lab Technician	90.00			

Table 12. HEALTH FACILITIES BY DEPARTMENTS AND ARRONDISSEMENTS

Department with Arrondissement	Hospitals	Dispensary Hospitals	Health Centers	Dispensaries
West	13	3	13	31
Port-au-Prince	12	2	13	27
Leogane	1	1	-	4
North	1	6	1	25
Cap-Haitien	1	-	1	5
Trou du Nord	-	-	-	2
Gde Riv du Nord	-	2	-	10
Plaisance	-	1	-	3
Borgne	-	-	-	3
Limbé	-	3	-	2
Artibonite	3	3	1	16
Gonaives	1	1	1	9
St. Marc	2	1	-	2
Dessalines	-	1	-	3
Marmelade	-	-	-	2
North-West	1	5	0	14
Port-de-Paix	1	4	-	5
Mole St. Nicolas	-	1	-	9
North-East	0	1	0	21
Fort-Liberté	-	1	-	11
Vallieres	-	-	-	10
Central	2	0	0	14
Hinche	1	-	-	7
Mirebalais	-	-	-	2
Lascohobas	1	-	-	5
South	2	2	1	22
Cayes	1	1	1	11
Aquin	-	-	-	7
Coteaux	-	1	-	4
South-East	1	1	0	24
Jacmel	1	1	-	14
Belle-Anse	-	-	-	10
Grande Anse	1	2	0	23
Jeremie	1	-	-	11
Tiburon	-	-	-	5
Anse-a-Veau	-	2	-	7
TOTAL - HAITI	24	23	16	190

Table 12 (cont'd.)

Department with Arrondissement	Total Units	Number of Beds	Number of Physicians
West	60	1,631	242
Port-au-Prince	54	1,503	235
Leogane	6	128	7
North	33	335	22
Cap-Haitien	7	283	14
Trou du Nord	2	--	1
Gde Riv du Nord	12	52	2
Plaisance	4	2	1
Borgne	3	--	1
Limbe	5	--	3
Artibonite	23	457	34
Gonaives	12	185	12
St. Marc	5	260	18
Dessalines	4	12	3
Marmelade	2	--	1
North-West	20	490	13
Port-de-Paix	10	308	8
Mole St. Nicolas	10	182	5
North-East	22	20	2
Fort-Liberte	12	20	2
Vallieres	10	--	-
Central	16	133	4
Hinche	8	88	2
Mirebalais	2	--	1
Lascohobas	6	45	1
South	27	263	9
Cayes	15	249	7
Aquin	7	--	-
Coteaux	5	14	2
South-East	26	115	8
Jacmel	15	115	8
Belle-Anse	11	--	-
Grande Anse	26	121	10
Jeremie	12	85	6
Tiburon	5	--	-
Anse-a-Veau	9	36	4
TOTAL - HAITI	253	3,565	344

Table 13. HEALTH PROFESSIONALS BY LOCATION OF EMPLOYMENT

Facility	Physicians	Dentists	Nurses	Auxiliary Nurses
University Hospital	129*	2	111	67
Sanatorium	19	7	10	31
Isaie Jeanty	18	-	23	53
Psychiatric Hospital	7	-	6	13
Grace Children Hospital	2	-	1	7
La Sainte Famille	4	-	1	4
Saint Francois	1	1	16	-
Hospital Francais	-	-	15	3
Hospital Canape Vert	-	-	20	22
Sacré-Coeur	2	-	3	2
Hospital de 1'OFATMA	-	-	-	-
Cen. Santé de la Cathedrale	4	3	3	5
Cen. du Portail Leogane	8	3	-	27
Cen. du Bel Air	1	1	5	2
Cen. de St. Martin	2	2	1	-
Cen. Materno-Infantile	-	-	-	-
Cen. de Petionville	6	2	2	2
Cen. de Carrefour	2	1	2	5
Disp. de St. Francois	1	1	16	-
Disp. de 1'Asile Communale	-	-	-	-
Disp. de St. Antoine	2	-	2	3
Disp. de Ste. Madeleine	-	-	-	-
Disp. Haiti Metal	-	-	-	-
Disp. Diquini	3	-	2	-
Cité Simone DUVALIER	2	-	1	5
Cité de Trou Sable	1	-	-	1
Center Santé de la saline	4	3	4	2
TOTAL	218	26	249	254

Information from: "Infrastructures Santé Publique"
Conseil National de Development et de Planification
Port-au-Prince, 1973.

* The figure for physicians at the University Hospital is not very meaningful. It indicates that a large percentage of the physicians practicing in Port-au-Prince have privileges at the University Hospital.

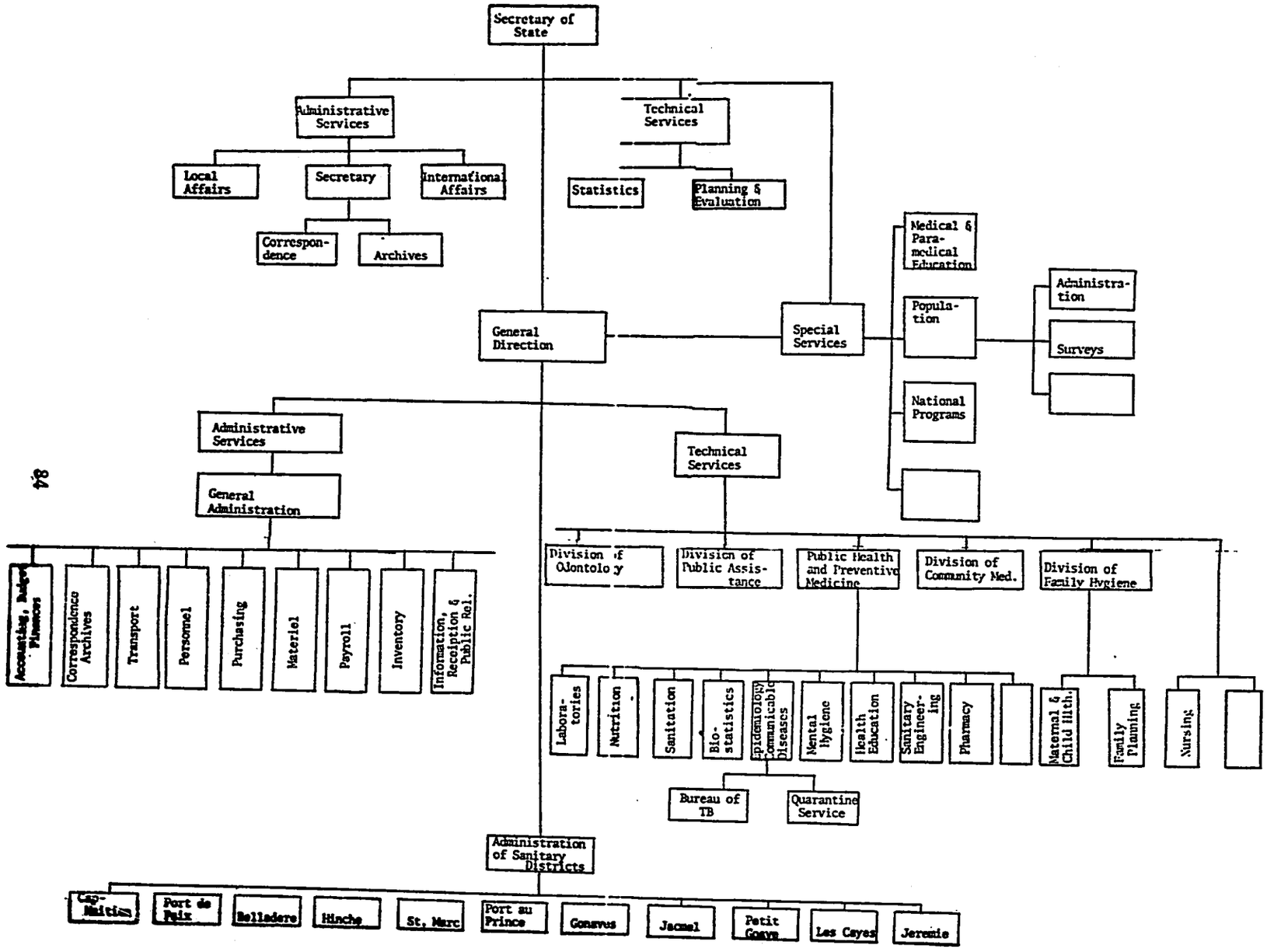
Table 14. INSTITUTIONS PROVIDING MATERNITY SERVICES

Maternities	Deliveries per Year	Beds Available	Beds in Use When Visited
University Hospital	8,777	76	76
Isaie Jeanty Chancerelles	8,255	64	64
Hospital Justinien, Cap-Haitien	2,880	49	32
Hospital Milot	0	6	0
Hospital Plaissance	15	5	0
Bon Samaritain, Limbe	360	10	0
Hospital Saint Jean, Limbe	400	9	?
Notre-Dame de Fatima, Ouanaminthe	480	4	2
Gonaive Hospital	1,341	30	10
Saint Marc Hospital	1,515	41	12
Hinche Hospital	645	14	7
Jacmel Hospital	463	17	5
Bainet Hospital	8	4	1
Belladere Hospital	299	10	9
Grand Goave Hospital	76	4	2
Paillant Hospital	120	5	0
L'Anse a Veau Hospital	300	8	6
Bon Samaritain, Miragoane	0	6	0
Port-de-Paix Hospital	600	9	2
lapointe Hospital	1,240	7	7
Les Cayes Hospital	1,400	21	13
Port-a-Piment Hospital	144	4	?
Laborde Hospital	50	5	?
Jeremie Hospital	528	21	7
TOTAL	29,896	429	255

Table 15.
PROVINCIAL PEDIATRIC CLINICS IN ORDER OF IMPORTANCE

Pediatric Clinic	Number Annual Visits	Vaccinations Performed
Bon Samaritain, Limbe**	31,200	DPT and polio
Albert Schweitzer Hospital**	18,720	DPT-BCG-polio-Te-TAB
Populorum Progressio, Plaisance**	10,405	DPT-BCG-TAB-polio-Te
Beraca Medical Center**	10,400	DPT-TAB-polio
Grande Riviere du Nord Hospital***	9,600	BCG-DPT,TAB-polio-Te
Hospital Dodo de Bonneau**	9,360	BCG-TAB
Hospital Mazenod, Camp Perrin**	7,800	BCG-DPT-Te-TAB
Hospital St. Antoine, Jeremie*	6,240	None
Hospital Justinien, Cap-Haitien*	6,240	None
Notre-Dame de Fatima, Ouanaminthe**	4,500	None
Hospital Gebeau (near Jeremie)**	3,120	None
Hospital Notre Dame du Cap, Aquin**	2,600	BCG-DPT
Petit-Goave Hospital*	2,296	Te-polio
Hospital St. Jean, Limbe***	2,100****	Yes, but no specification
Hospital Bon Samaritain, Miragoane**	2,080	DPT-polio-TAB
Hbspital Pte. Riviere de l'Artibonite*	2,080	None
Hospital Port de Paix	2,080	None
Hbspital Paillant**	2,000	TAB
Hospital Laborde**	1,560	BCG-DPT-TAB
Hospital 4 Chemins, Cayes*	1,240	None
Disp. religieux de Thomassique**	1,040	None
Hosp. disp. Grand-Goave*	1,030	DPT
Disp. Vialet*	388	BCG-DPT-polio
Belladere Hospital*	57	None
Cayes Hospital*	?	BCG-DPT-polio
L'Anse a Veau Hospital*	?	DPT-DiTe-TAB
St. Jeanne d'Arc Hospital (Charpentier)**	?	None
St. Michel Hospital, Jacmel*	?	None
Gonaives Hospital*	?	None
Passe-Reine Hospital**	?	?
St. Marc Hospital	?	None
Hinche Hospital	?	None
Mirebalais dispensary*	?	None

* Government establishment
** Private establishment
*** Mixed establishment
**** In four months.


Secretary of State
Administrative Services
Technical Services
Local Affairs
Secretary
International Affairs
Statistics
Planning & Evaluation
Correspondence
Archives
Medical & Paramedical Education
Administration
Population
Surveys
General Direction
Special Services
National Programs
Administrative Services
Technical Services
General Administration
Accounting, Budget & Finances
Correspondence Archives
Transport
Personnel
Purchasing
Materiel
Payroll
Inventory
Information, Reception & Public Rel.
Division of Odontology
Division of Public Assistance
Public Health and Preventive Medicine
Division of Community Med.
Division of Family Hygiene
Laboratories
Nutrition
Sanitation
Bio-statistics
Epidemiology Communicable Diseases
Mental Hygiene
Health Education
Sanitary Engineering
Pharmacy
Maternal & Child Hlth.
Family Planning
Nursing
Bureau of TB
Quarantine Service
Administration of Sanitary Districts
Cap-Haitien
Port de Paix
Belladere
Hinche
St. Marc
Port au Prince
Gonaves
Jacmel
Petit Goave
Les Cayes
Jeremie

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