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9. ABSTRACT

This report is organized into three major sections: National/Regional Health Policy and Infrastructure; Resource Availability; and Donor Assistance in the Health Sector. The thirteen English-speaking territories which are the primary focus of this study include Jamaica, Guyana, Barbados, Grenada, Trinidad, Tobago, St. Vincent, St. Lucia, Dominica, St. Kitts-Nevis-Anguilla, the British Virgin Islands, Belize and Montserrat. The report is prefaced by a brief overview of factors influencing health, such as geography and climate, economy, education, language, socio-cultural attitudes, transportation and communications. In spite of wide divergencies in size, population density and political organization, a common culture is shared by all the countries of the Caribbean. Family patterns include serial monogamy, early sexual activity, and frequent illegitimate births. Legal or church marriage is rare. In 1960 Census data, 55% of private households contained 1-2 rooms, with 1.5-1.9 persons per room. The role of superstition is pervasive in Caribbean society and affects the nature of mental health problems, treatment of children, and the origin of diseases. The Commonwealth Caribbean Conference of Ministers Responsible for Health has attempted to place some priority on the identification of goals and objectives in the formulation of national and regional health policy. These priorities are based on the number of people affected, the susceptibility of the problem to remedial and preventive measures, and its social and economic importance. Numerous tables and annexes contain data specific to various aspects of the health sector. Appendices are: "Magnitude of Health Problems," "Multilateral Assistance Projects in the Health Sector PAHO/WHO/UNDP," and "Country Health Summaries."

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COMMONWEALTH CARIBBEAN HEALTH SECTOR STUDY

PART I: THE HEALTH SECTOR IN PERSPECTIVE

The Caribbean Working Group
May 1977

ACKNOWLEDGEMENT

I would like to express appreciation to all the members of the Caribbean Working Group for their time and patience in the review and analysis of the Commonwealth Caribbean Health Sector. In addition, special acknowledgement is indicated for the contribution of the team leaders of each sector who drew on the expertise within their groups to produce cogent reports in their individual areas.

The editorial and technical assistance of Dr. Kenneth Farr and Robert Emrey was also greatly appreciated. The sections on the Health Milieu (Part I) and the Appendix on Population Characteristics and Demography were excellently written by Julie Weissman and Steven Lucas respectively.

This document was prepared within the Division of Program Analysis of the Office of International Health, Public Health Service, U.S. Department of Health, Education and Welfare at the request and with the support of the U.S. Agency for International Development. This study does not necessarily reflect United States Government policy but provides a background against which further analysis and health program development may be initiated.

Sincere thanks are extended to the secretarial staff, particularly Ms. Laurie Solow, who patiently worked on the numerous drafts of this document. She was assisted in bringing it to its final form by Ms. Kathy Howard and Mr. Alan Abboud.

Special thanks, as well, are extended to many of the staff at the Pan American Health Organization who assisted the Caribbean Working Group in providing information and support of our efforts.

Mark Laskin
May 1977

COMMONWEALTH CARIBBEAN HEALTH SECTOR STUDY

Part I: The Health Sector in Perspective

RSSA HEW L-74 GTS

Prepared by: Mark J. Laskin
Division of Program Analysis
Office of International Health
Department of Health, Education, and Welfare

for: U.S. Agency for International Development

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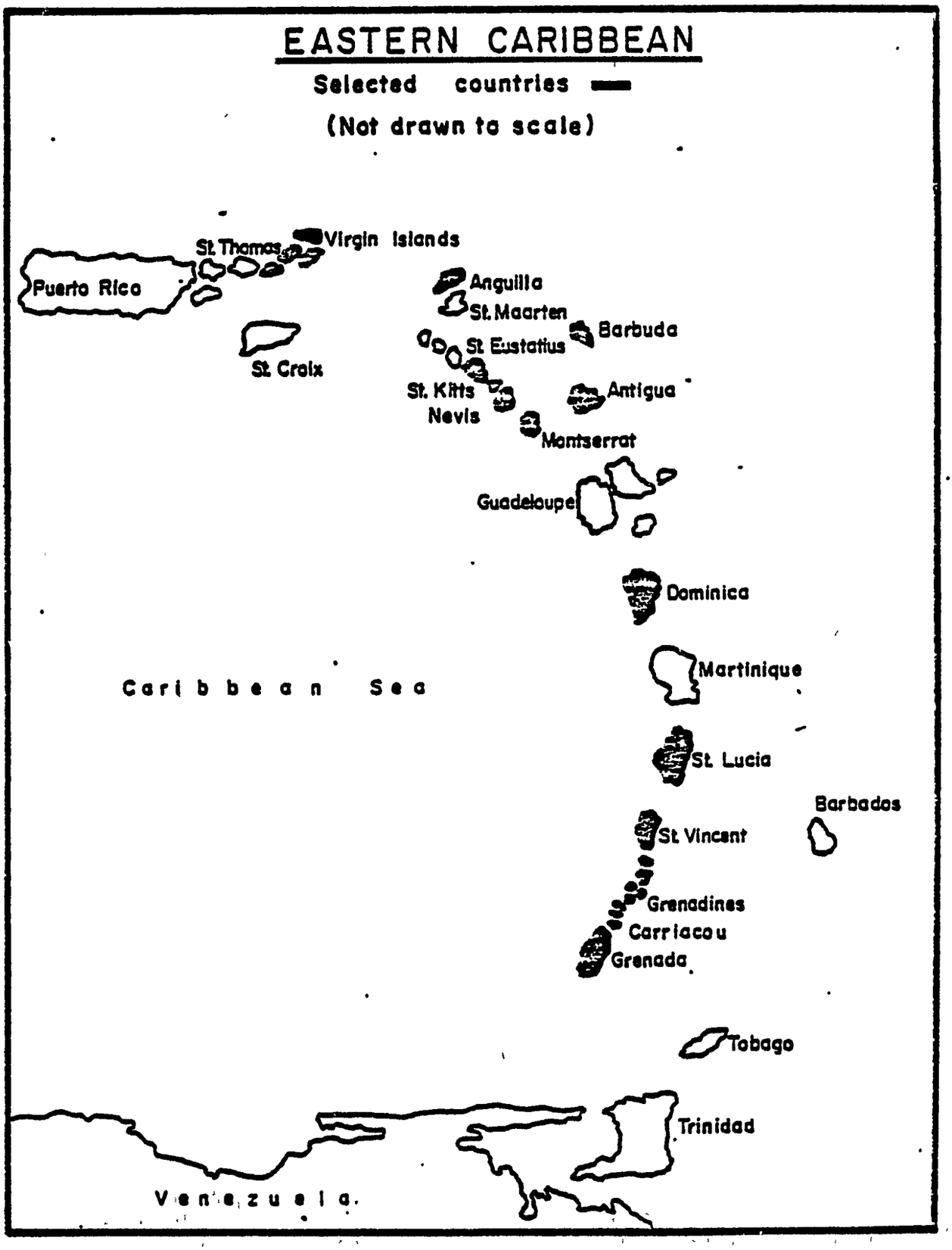
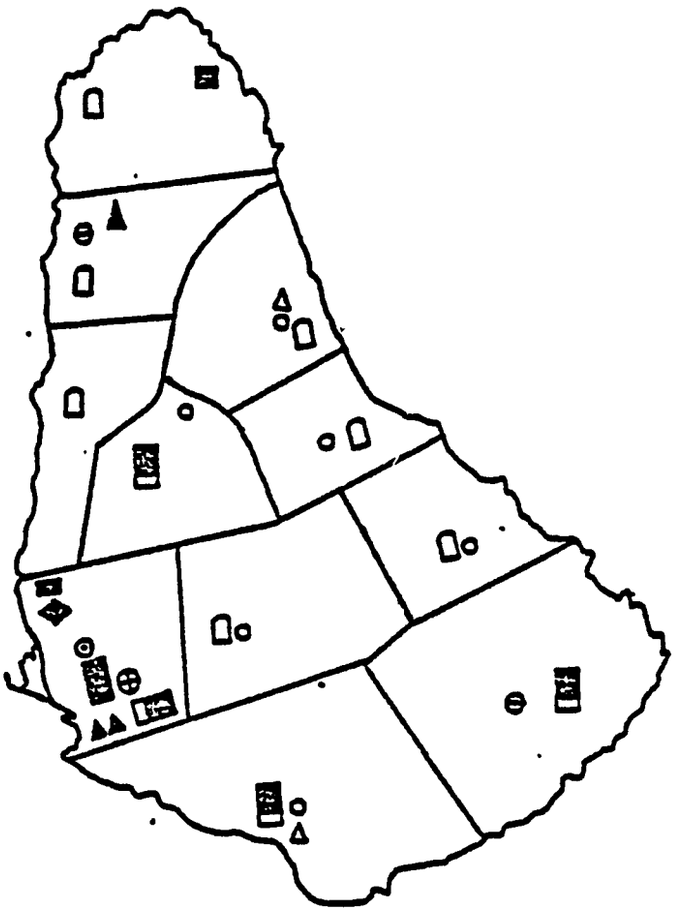

EASTERN CARIBBEAN
Selected countries
(Not drawn to scale)
St. Thomas
Virgin Islands
Puerto Rico
Anguilla
St. Maarten
Barbuda
St. Eustatius
St. Croix
St. Kitts
Nevis
Antigua
Montserrat
Guadeloupe
Dominica
Martinique
Caribbean Sea
St. Lucia
Barbados
St. Vincent
Grenadines
Carriacou
Grenada
Tobago
Trinidad
Venezuela.

MAP OF BARBADOS SHOWING HEALTH INSTITUTIONS

APPENDIX I



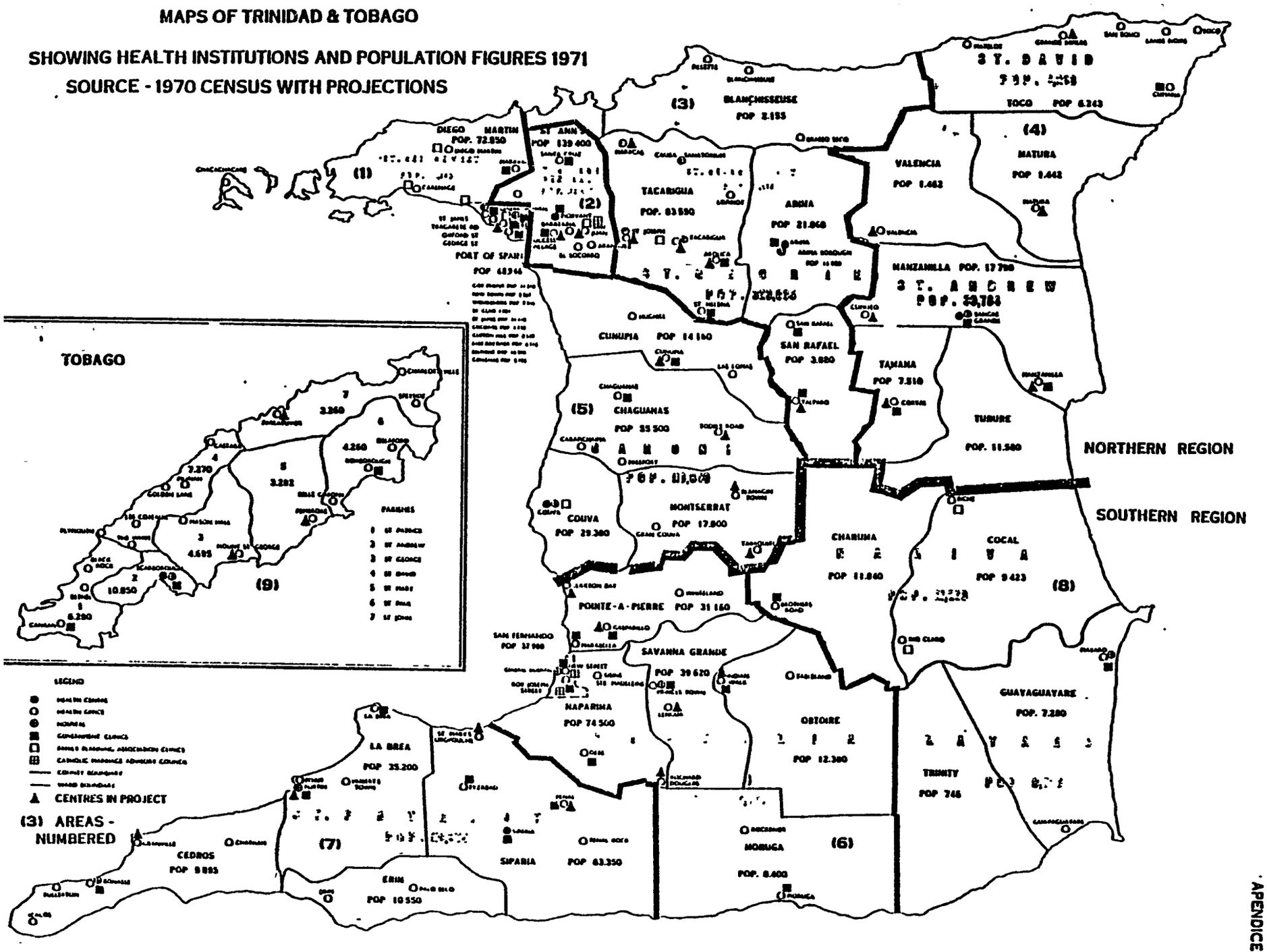
KEY TO MAP

- Queen Elizabeth Hospital, an acute general hospital with capacity for 593 beds
- District Hospital.
- District Hospital and Out-patient Clinic.
- Out-patient Clinic.
- Mental Hospital - a psychiatric Hospital with capacity for 630 beds.
- District Maternity Hospital with capacity for 20 beds.
- Leper Hospital with capacity for 20 beds.
- St. Joseph Hospital, a private institution with capacity for 100 beds.
- Other private hospitals.
- Ennore Health Centre, the main health centre with Laboratory and X-Ray Unit.
- Health Centre St. Peter and St. Philip.
- Sub-Health Centre - district clinic run by the main health centre.
- National Nutrition Centre.

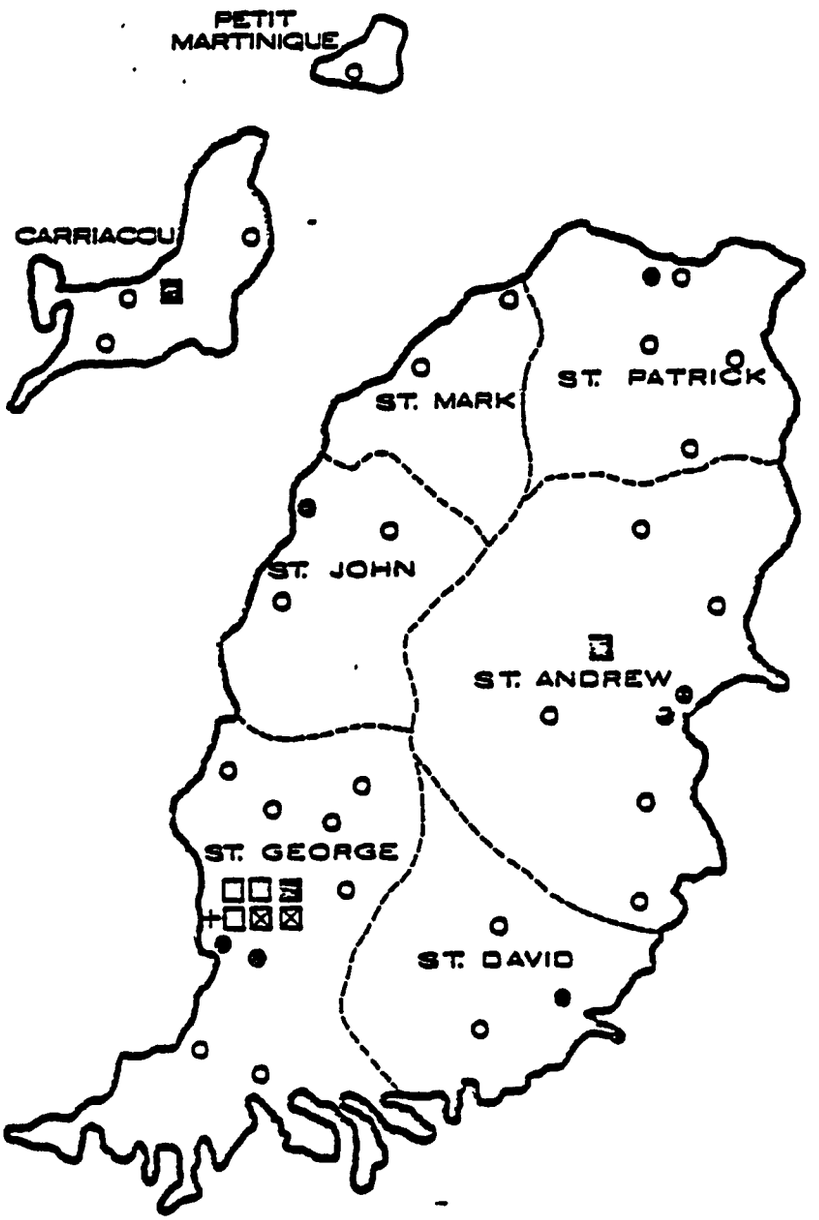
MAPS OF TRINIDAD & TOBAGO

SHOWING HEALTH INSTITUTIONS AND POPULATION FIGURES 1971

SOURCE - 1970 CENSUS WITH PROJECTIONS



APENDICE D



KEY TO MAP

ESTABLISHMENTS WITH BEDS:

- PUBLIC GENERAL HOSPITALS
- PUBLIC SPECIALIZED HOSPITALS
- \+ PRIVATE AND NON-PROFIT
- PRIVATE AND PROFIT-MAKING

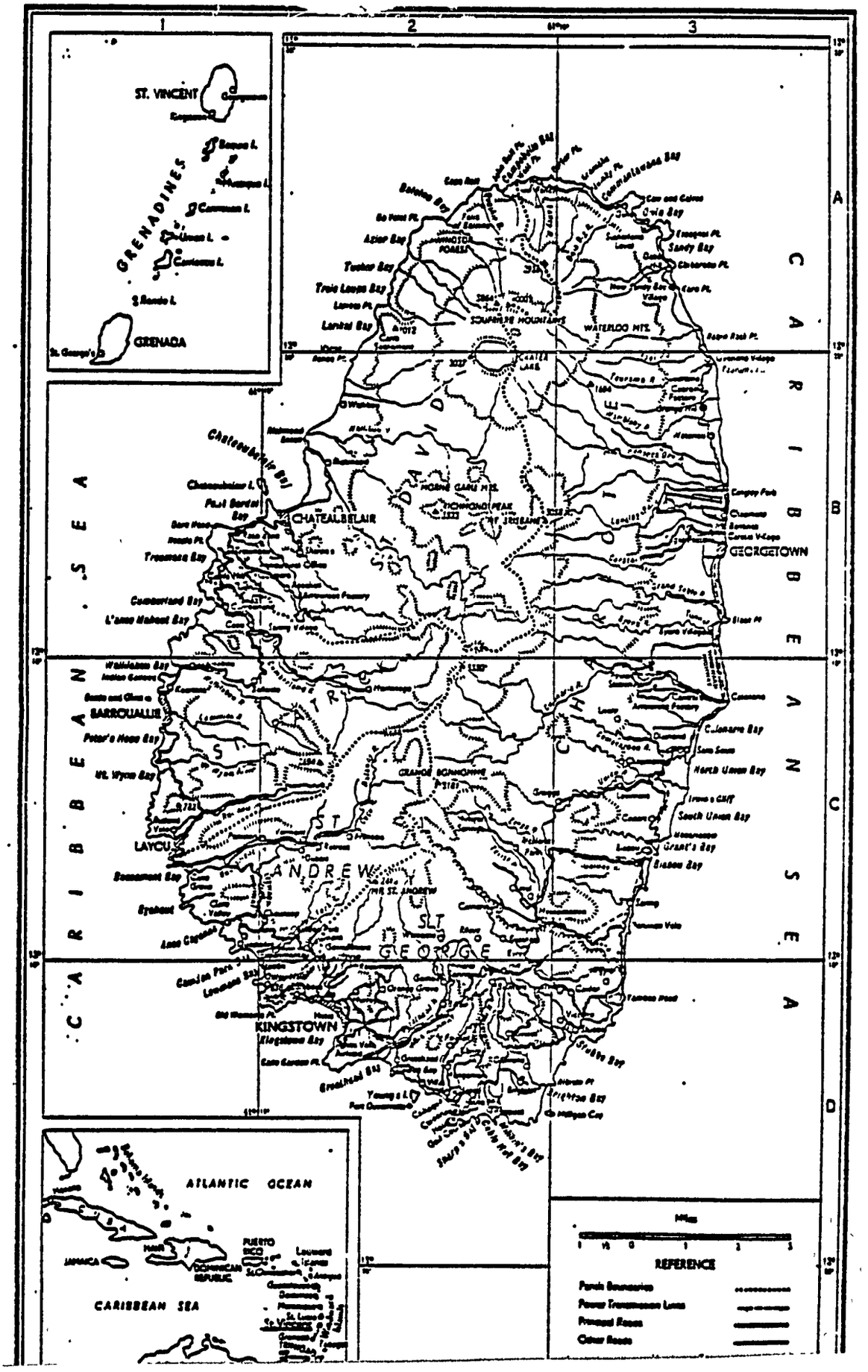
ESTABLISHMENTS WITHOUT BEDS:

- HEALTH CENTERS
- VISITING STATIONS
- NON-PROFIT CLINICS

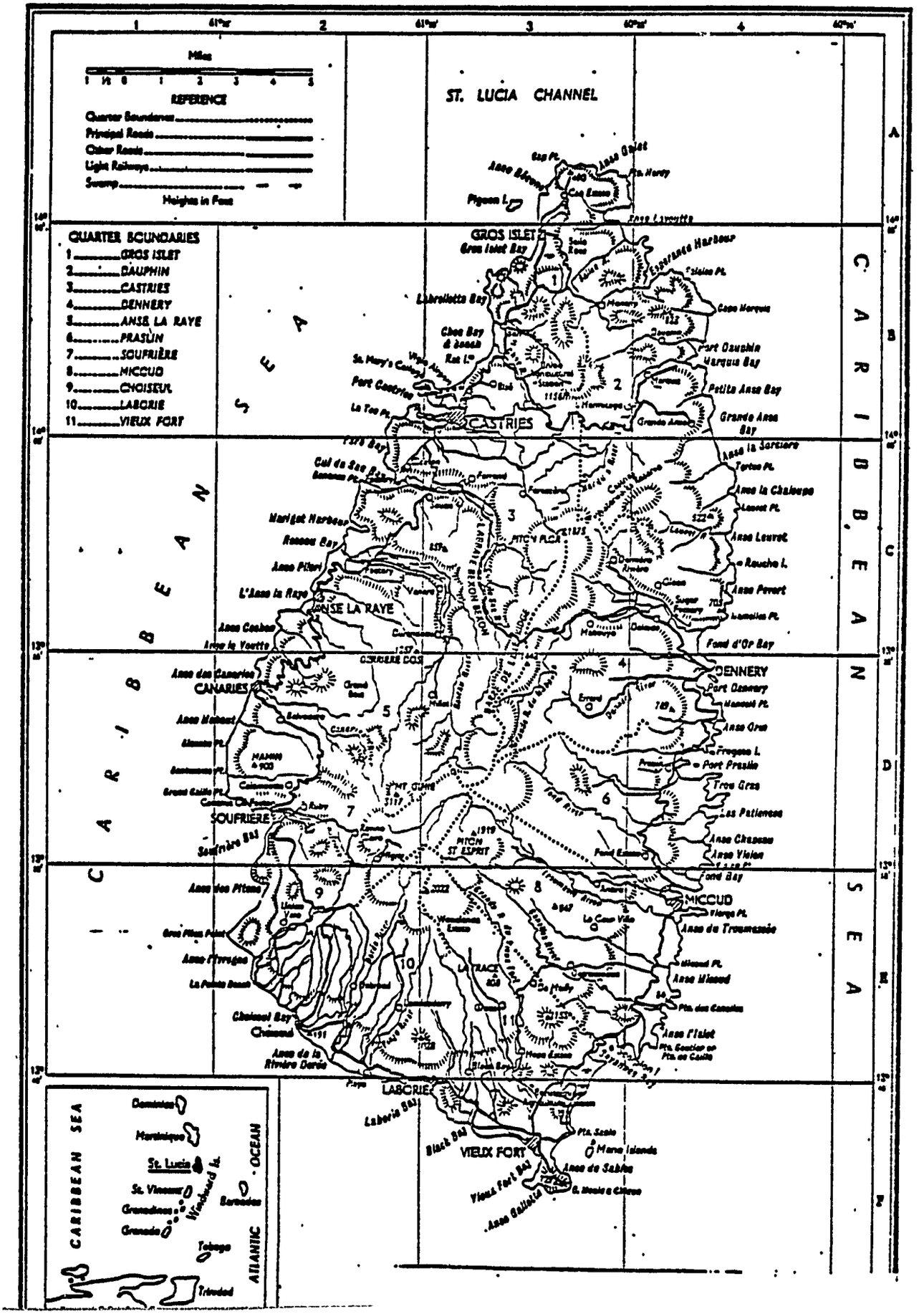
GRENADA

MAP OF ESTABLISHMENTS OF THE HEALTH SECTOR

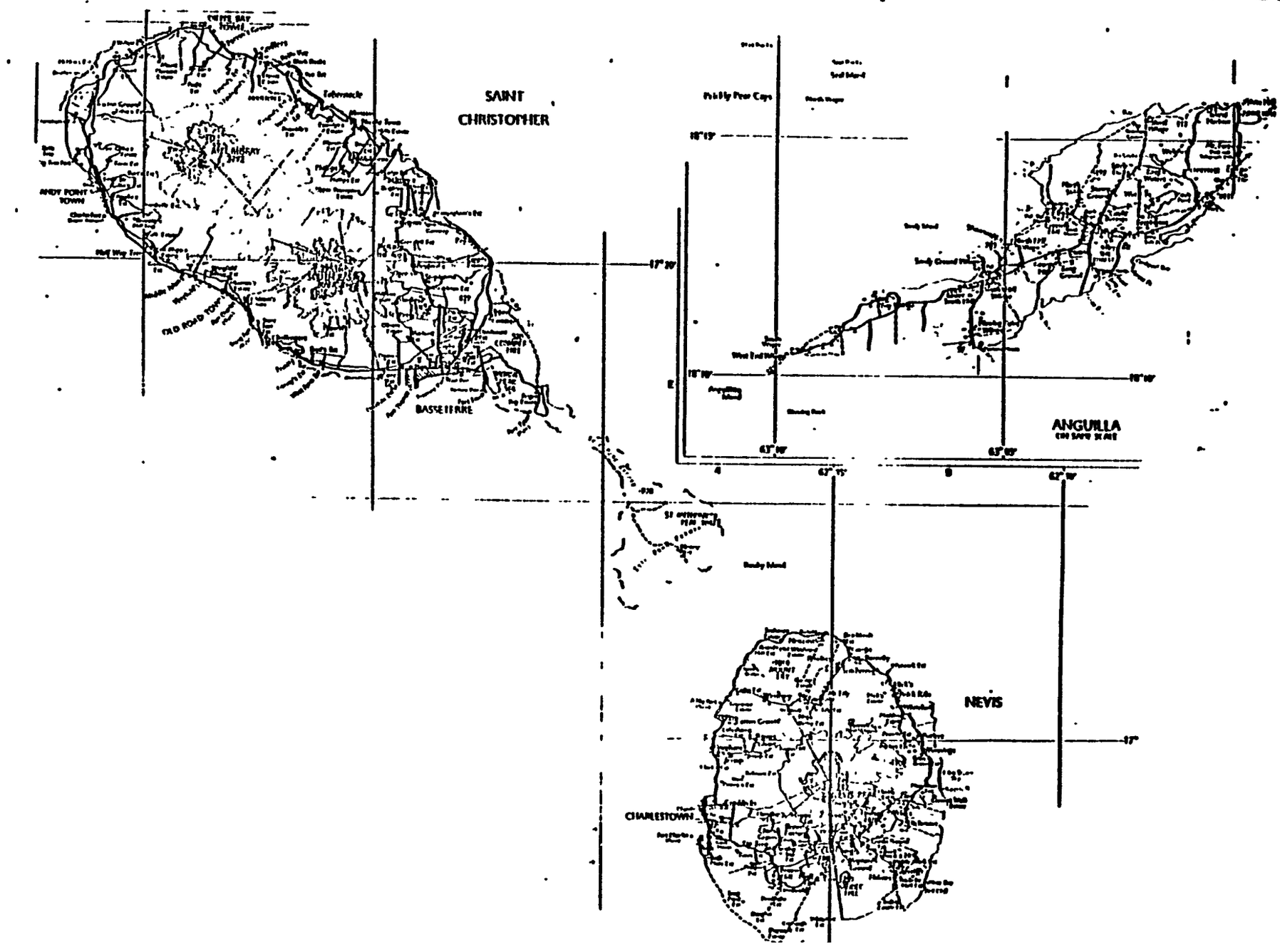
SAINT VINCENT



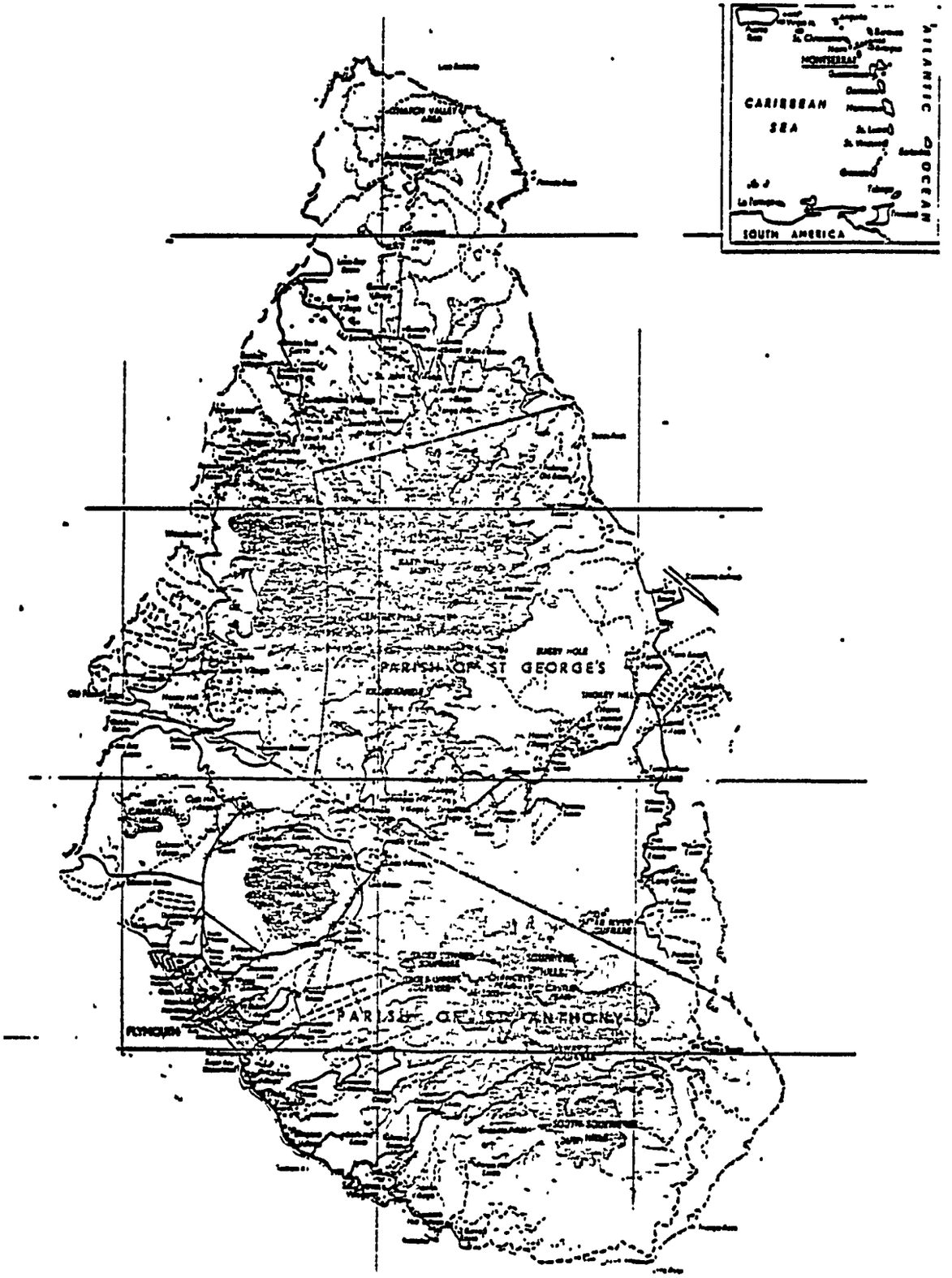
SAINT LUCIA


ST. LUCIA CHANNEL
CARIBBEAN SEA
ATLANTIC OCEAN
REFERENCE
QUARTER BOUNDARIES
1 GROS ISLET
2 DAUPHIN
3 CASTRIES
4 DENNERY
5 ANSE LA RAYE
6 PRASLIN
7 SOUFRIÈRE
8 MICCOUD
9 CHOISEUL
10 LABORIE
11 VIEUX FORT
GROS ISLET
CASTRIES
ANSE LA RAYE
CANARIES
SOUFRIERE
DENNERY
MICCOUD
LABORIE
VIEUX FORT
PITON FLORE
MT GIMIE
PITON ST ESPRIT
Pigeon I.
Martinique
St. Lucia
St. Vincent
Grenadines
Grenada
Barbados
Tobago
Trinidad
Windward Is.

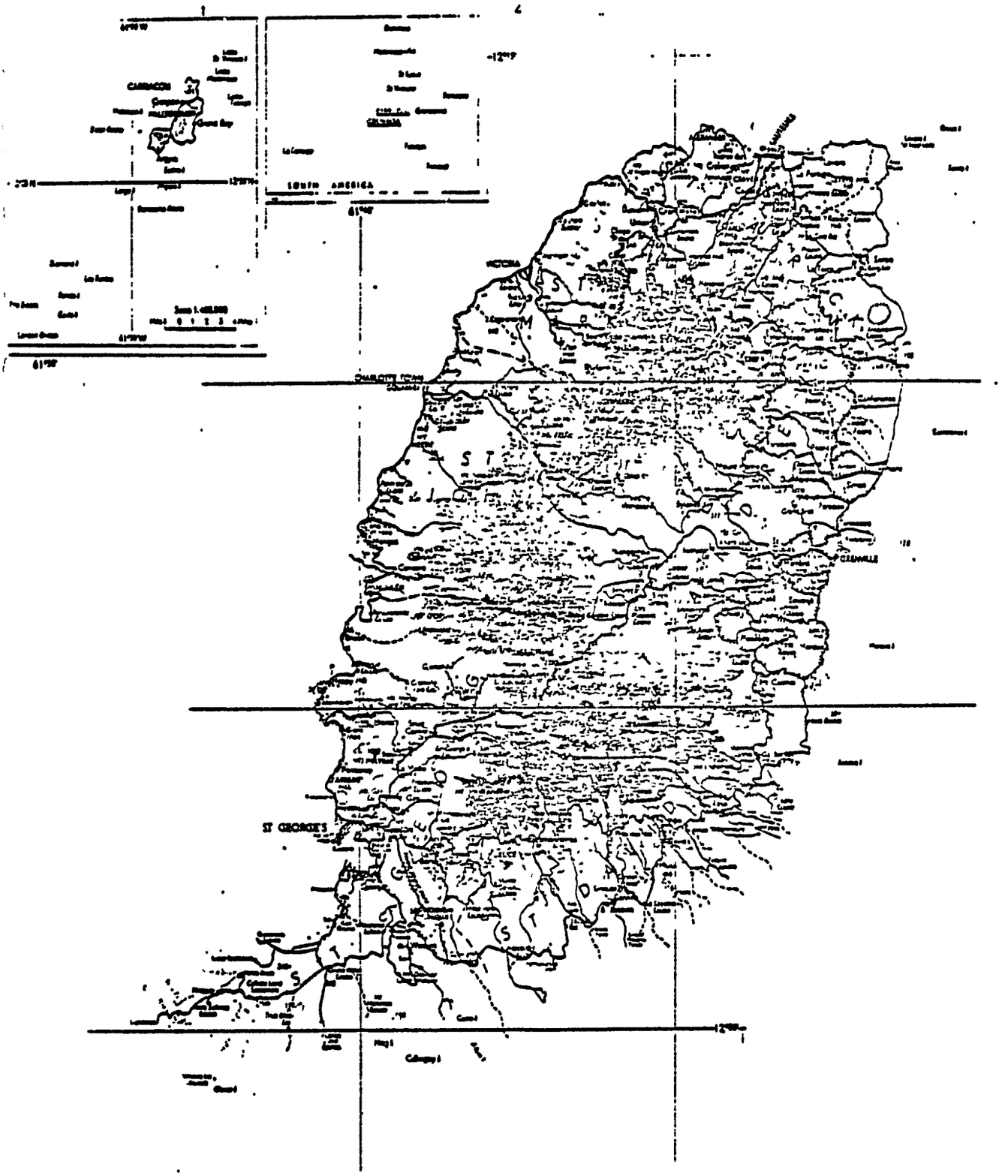
SAINT CHRISTOPHER - NEVIS - ANGUILLA



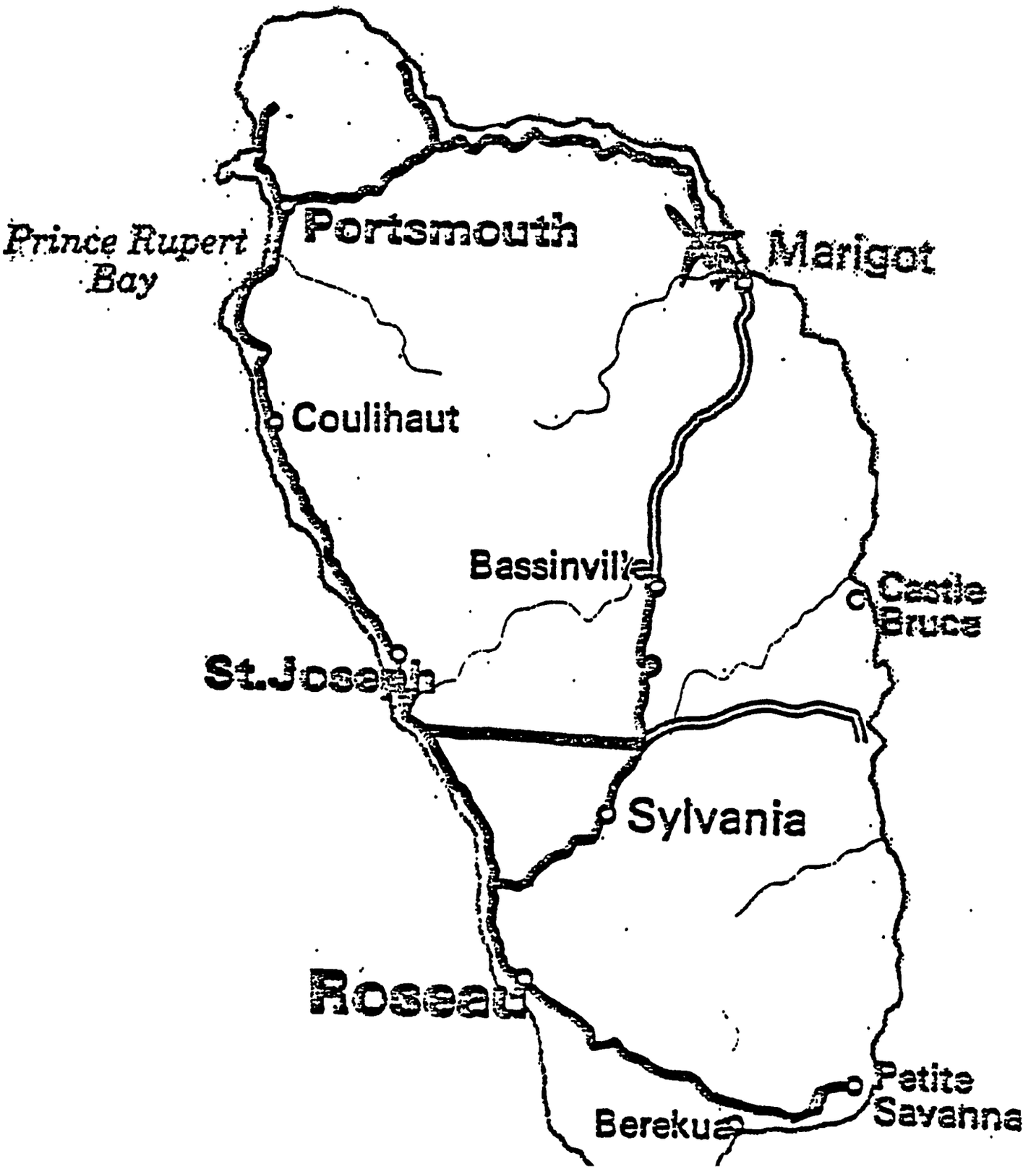
MONTSERRAT


CARIBBEAN SEA
ATLANTIC OCEAN
SOUTH AMERICA
PARISH OF ST GEORGE'S
PARISH OF ST ANTHONY

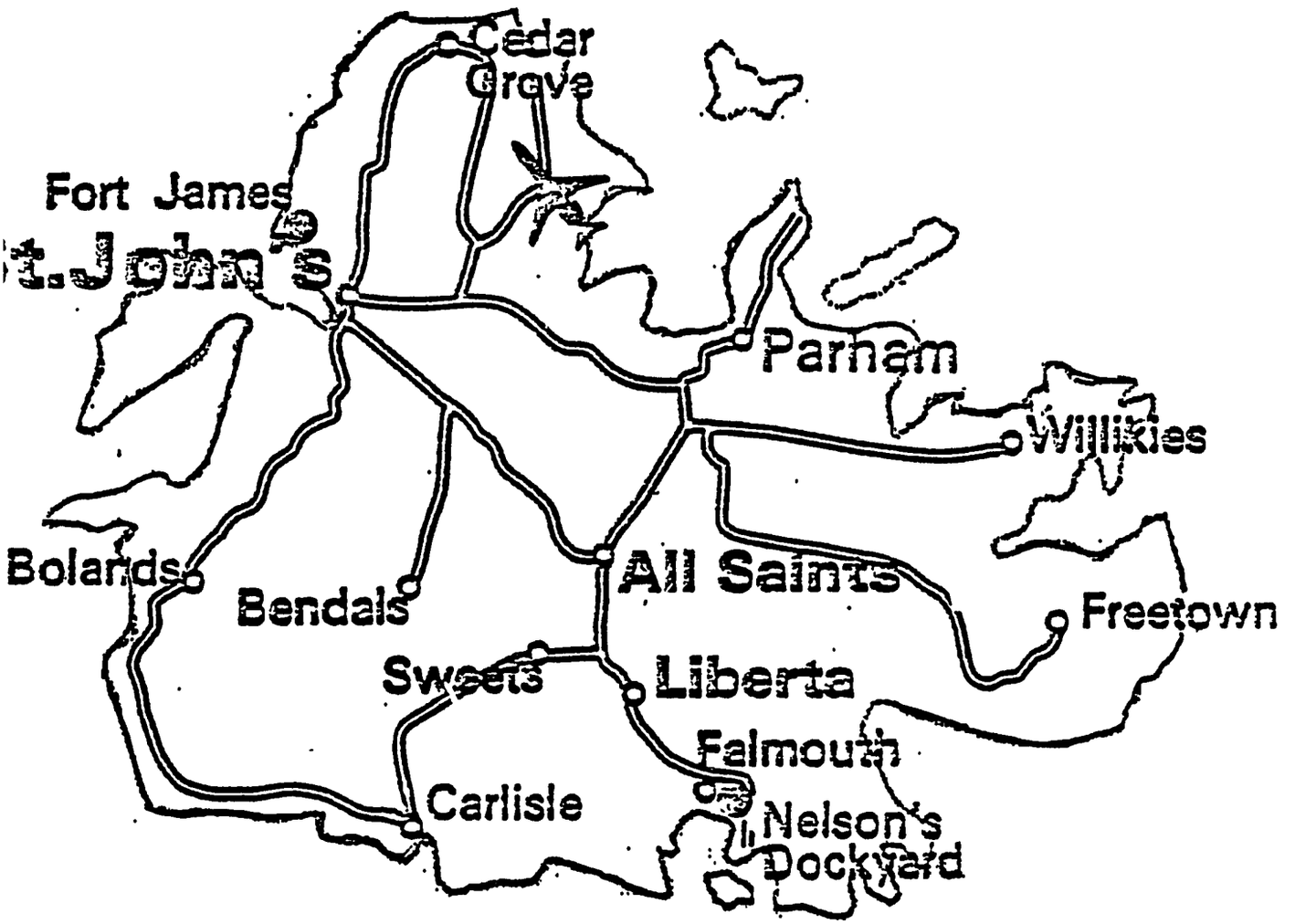
GRENADA



Dominica


Prince Rupert Bay
Portsmouth
Marigot
Coulihaut
Bassinville
Castle Bruce
St.Joseph
Sylvania
Roseau
Petite Savanna
Berekua

Antigua


Cedar Grove
Fort James
St. John's
Parham
Willikies
Bolands
Bendals
All Saints
Freetown
Sweets
Liberta
Falmouth
Carlisle
Nelson's Dockyard

The Caribbean Working Group

Coordinator

Mark Laskin, OIH/DHEW

Communicable Diseases/Epidemiology

Julie Weissman, OIH/DHEW (Team Leader)
Harrison Stetler, CDC/DHEW
Joseph Stockard, TA/H, AID
Karl Western, PAHO

Environmental Health

Robert Emrey, OIH/DHEW (Team Leader)
Joe Davis, TA/H, AID
Frank Schulte, IHS/DHEW
Vic Weyman, TA/H, AID

Management, Infrastructure, Planning and Finance

Paul Ahmed, OIH/DHEW (Team Leader)
John Gallivan, OIH/DHEW (Team Leader)
Charles Briggs, TA/DA, AID
Al Davidson, Consultant - TA/H, AID
John Eason, APHA
Kenneth Farr, OIH/DHEW

Manpower

Karen Cox, OIH/DHEW (Team Leader)
Dennis Chasse, OIH/DHEW
John Eason, APHA
Francis Murphy, TA/H, AID
Peggy Pentz, HSA/DHEW

Nutrition

Scott Loomis, OIH/DHEW (Team Leader)
John McKigney, TA/N, AID
Linda Haverberg, LA/DR, AID

Population

Steve Lucas, OIH/DHEW
Karen Lashman, OIH/DHEW
Mark Laskin, OIH/DHEW

Table of Abbreviations Utilized in the Commonwealth Caribbean Health Section Study

CMRH	Conference of Ministers Responsible for Health
CHMC	Caribbean Health Ministers Conference
CFNI	Caribbean Food and Nutrition Institute
CAREC	Caribbean Regional Epidemiology Center
CARICOM	Caribbean Community Secretariat
PAHO	Pan American Health Organization
WHO	World Health Organization
IDB	Inter-American Development Bank
CDB	Caribbean Development Bank
AID	U.S. Agency for International Development
UWI	University of the West Indies

COMMONWEALTH CARIBBEAN
HEALTH SECTOR BACKGROUND STUDY

Geography & Climate

The thirteen English-speaking territories which are the primary focus of this study include five independent countries -- Jamaica, Guyana, Barbados, Grenada, and Trinidad and Tobago, five associated states -- St. Vincent, St. Lucia, Dominica, St. Kitts-Nevis-Anguilla; and three crown colonies--the British Virgin Islands, Belize, and Montserrat. All are islands with two exceptions; Guyana borders Venezuela on the South American continent and Belize, in Central America, is bordered by Mexico and Guatemala.

The islands form a chain from Grenada near the Venezuelan coast, to the British Virgin Islands near Puerto Rico. The arc of islands from Grenada to Anguilla is known as the Lesser Antilles. These islands are further divided into two groups, the Windward Islands (from Grenada to Dominica) and the Leeward Islands (from Guadeloupe to Anguilla). The islands separate the Atlantic Ocean to the east from the Caribbean Sea to the west. They may be classified as coral in origin or volcanic. The coral islands (Barbados, Antigua, Anguilla, Barbuda, and some of the Br. Virgin Islands) are flat and dry and blessed with beautiful white beaches. The volcanic islands are hilly, dense with tropical flora, have heavy rainfall, and fewer beaches (usually of dark sand). In many areas the steep slopes drop sharply into the sea. The climate is generally tropical, with a mean temperature of 80^{0} fahrenheit throughout the year. During winter nights the temperature drops to 72^{0} and rarely rises above 89^{0} in the summer. Humidity is high, especially from

August to November.

Trinidad and Tobago are not geologically a part of the Antillean Arc. Trinidad, the larger island, contains three separate mountain ranges, extensive swamps in some areas, and fertile plains. Tobago is dominated by a single mountain chain, but most of its terrain is uneven. Because its mountains have retained their forest cover, unlike Trinidad, the heavy seasonal rains which are common to both islands have not caused as much flooding and erosion in Tobago.

Jamaica's principal geographical features are an interior plateau of white limestone, two mountain ranges in the eastern and central portions of the island, and coastal lowlands and valleys. Rainfall is, as in the other islands, heaviest in the mountainous regions of the country.

Guyana's 83,000 square miles on the South American mainland include a coastal plain, a grassy savanna, and an interior forest. Three rivers flow north-south. The climate, as in the islands, is mild and tropical although the temperature range (60^{0} F to 103^{0}F) is wider, especially in the interior.

Belize, in Central America, has been deforested over the centuries by lumbering activities. It is primarily savanna, with many small rivers and a minor mountain range in the South. The irregular coast and extensive reef system make the area attractive for both commercial and sport fishing.

The mild tropical climate of the countries in the area is conducive to the spread of those diseases which depend upon vectors for transmission

and those which depend upon moisture and temperature. Malaria, dengue, yellow fever, and Chagas are among the vector-borne diseases. Schistosomaisis and dracontiasis depend on intermediate hosts found in the area, while ankylostomaisis and enteric infections are also favored by the tropical climate.

Economy

The English-speaking countries of the Caribbean area are gradually developing an integrated regional economic system. The social and economic benefits which will be derived from this approach to development are expected to be far greater than those which would accrue through the use of independent economic development strategies.

The obstacles to development are many including a combined GDP of only (U.S.) $3 billion, an area population of barely 4.5 million, and heavy dependence on a few export products. The resource base for the region as a whole is good relative to the size of the population, however, these assets are unevenly distributed within the region. Trinidad and Tobago and Jamaica account for almost seventy-five percent of the region's GDP. Equitable distribution of the benefits of development, given the dominant position of these two countries, will be difficult to achieve. The problem of maintaining the sovereignty of each country will persist as economic integration proceeds, and the political stability of the area will continue to be threatened by the poverty, unemployment, and racial and ethnic tensions which are characteristic of the region.

For purposes of economic analysis, the countries of the region can be divided into two groups: the More Developed Countries -- Jamaica, Trinidad and Tobago, Guyana, and Barbados, and the Less Developed Countries -- Belize, and the Leeward and Windward Islands.

All of the countries of the region share the same problems of heavy dependence on a few export items and a wide variety of import items

(including food). They are all extremely vulnerable to international prices as a result. Resource distribution within the region is uneven, however, and is the basis for the dichotomy between the MDC's and the LDC's.

The bauxite, alumina, and petroleum which are extracted and processed in Jamaica, Guyana, and Trinidad and Tobago account for their domination of regional economic activity. (See Chart for GDP by country). In addition, the larger population base of these three countries provides an internal market of a size which has been sufficient to encourage the development of some industrial and manufacturing capacity. The revenues generated by the mineral activities have allowed the governments of these countries to expand public sector employment as well.

The LDC's, on the other hand, have experienced a more limited economic growth because of the structural problems inherent in their small size and limited supply of resources. While the beaches and agreeable climate have encouraged the development of tourism (which provides 60% of the Area's foreign exchange earnings) the potential of the agriculture sector has yet to be realized. Despite the fact that agricultural production is the mainstay of the island economies, the land tenure system and the perceived opportunities for urban employment have created major obstacles to development. Major agricultural export items include sugar, bananas, cocoa, citrus fruits, and spices.

One of the most serious problems for all of the countries of the region is employment. A long term decline in work rates has been noted

over the course of the past decade. The working age population increased by more than 11% during this period while employment fell by 12%. The decline was more pronounced in the MDC's of Jamaica, Guyana, and Trinidad and Tobago.

Employment in agriculture has declined to less than two thirds of the 1960 level. The neglect of the agricultural sector in favor of urban and industrial development and the rapid population growth in rural areas during the 1950's have depressed agricultural wages and encouraged migration to the cities. The relatively low productivity of the land and the stigma attached to the cultivation of traditional crops such as sugar (for which the land is well suited) have caused an estimated 500,000 acres of land to be taken out of production since 1960, which has further constricted the possibilities for rural employment.

The sectors which have expanded in virtually all countries of the region are services (tourism and government) and "other" employment which includes something of services, commerce, and construction. Employment in manufacturing has increased in Belize but has declined slightly in the rest of the region.

The urban-rural wage gap has encouraged urban migration. Urban wages have been raised by powerful trade unions, high wage norms established by the mineral sector, public sector wage policies, and the link between the urban and foreign labor markets. The public sector has both created more jobs and contributed to the problem caused by urban-rural wage differentials. Emigration policies of English-speaking

countries during the 1950's and 1960's provided access to high wage labor markets. Urban areas were generally regarded as the point of departure for overseas employment and as a result movement from rural to urban areas was further stimulated.

Regional cooperation and integration will be necessary if surplus funds from mineral and oil production are to be directed to an employment oriented investment pattern. In addition, price policies must be established which restore the relative profitability of agriculture and therefore encourage its expansion. Improvements in the educational system and the development of job training programs which are tied to the labor demands of the regional economy will aid in absorption of the rapidly growing labor force.

Because of the dependence of the area countries on foreign trade, export instability has greater consequences for these small countries than it does for larger developing countries. Changes in international terms of trade in recent years have been generally unfavorable to the area.

Stagnant prices for primary exports and rising prices for imports, especially food and fuel, have contributed to a situation in which consumption and investment exceed domestic production and income. External inflows currently finance investment and the excess of consumption over production. Domestic savings became negative in 1971 (See Table), probably because of the combined effects of an increase in emigration which increased the dependency ratio and an increase in government expenditures. Investment has been increasing rapidly, which reflects expenditures

on infrastructure as well as hotel construction. The cost of infrastructure for the islands is very high because of the necessity of developing independent systems (water, power, airports, seaports, etc.) for each.

The establishment of island planning units and the development of planning documents has been supported by assistance from the U.K., however staff constraints have prevented the production of useful planning materials. Another obstacle to planning has been the lack of statistical information, again due to personnel shortages. The lack of data also prevents the preparation of meaningful economic analyses of the region.

The currencies of Barbados, Belize, Eastern Caribbean, Guyana and Trinidad and Tobago were linked with sterling as of June, 1974. Jamaica maintains a parity relationship with the U.S.$. The Eastern Caribbean dollar is the currency of Antigua, Dominica, Grenada, Montserrat, St. Kitts - Nevis - Angiulla, St. Lucia, and St. Vincent. In the British Virgin Islands, the U.S. dollar is the predominant currency. Exchange rates were as follows:

U.S. $1.00 =	$2.00	Barbados Dollars
	1.71	Belize Dollars
	2.18	Guyana Dollars
	0.91	Jamaica Dollars
	2.00	Trinidad & Tobago Dollars
	2.00	Eastern Caribbean Dollars

Table A-1-a

Basic Economic Indicators for Caribbean Region Countries
(1971)

	Pop.	Area Km^2	Density	(U.S.$m) GDP	US$ GDP Per Cap.	Agricas % GDP	Exports % GDP	Imports % GDP	% Unemployed
LDC's	(000's)		(Km^2)						
Antigua	66.6	441.6	150.8	28.8	433	3.1	42.6	76.8	10.0
Dominica	71.4	787.4	90.7	19.8	277	29.4	34.0	69.9	7.0
Grenada	95.1	344.5	276.0	32.8	345	30.0	29.5	59.7	9.3
Montserrat	11.6	102.3	113.4	6.25	537	16.0	19.3	60.2	4.7
St. Kitts	45.7	352.2	129.8	16.8	367	24.4	32.4	80.3	5.1
St. Lucia	102.5	616.4	166.3	38	370	23.2	27.4	75.8	9.1
St. Vincent	88.8	384.0	231.3	19.5	220	24.8	23.6	80.2	10.7
Belize	123.5	22,966	5.4	68.9	550	15.3	20.0	48.0	4.7
MDC's									
Jamaica	1906.2	11,424	166.9	1282.7	673	9.3	37.6	43.9	11.3
Trin.& Tob.	951.6	5,128	185.6	964.05	1013	4.6	35.7	43.3	22.0
Barbados	237.8	429.9	553.2	160.75	676	38.0	57.0	79.7	7.7
Guyana	719.4	215,000	3.3	247.60	344	20.3	57.8	54.7	12.8
Br.Virgin Isl.	10.5	$59m^2$	177		400				

Table A-1-b

Sources and Uses of Resources, 1961-1971
(% of GDP)

		1961	1966	1971
1)	Gross Domestic Product	100.0	100.0	100.0
2)	Terms of Trade	--	--	--
3)	Imports (goods & n.f.s.)	45.1	57.1	72.4
4)	Exports (goods & n.f.s.)	26.8	32.1	33.2
5)	Resource Gap	18.3	25.0	39.2
	Resources Available (1+2+5)	118.3	125.0	139.2
	Consumption	118.3	96.4	105.0
	Investment		28.6	34.2
	Domestic Savings	n.a.	3.6	-5.0
	Public Savings	"		-3.2
	Private Savings	"		-1.8

Table [illegible]c

Ratio of Students Enrolled in Primary and Secondary Schools and In Universities to Population in Corresponding Age Groups By Country,

Area	Year	Ratio			Year	Ratio		
		Primary	Secondary	University		Primary	Secondary	University
Antigua	1963	.85	1.00	.01	1970	.66	.73	.00
Barbados	1960	.58	.69	.00	1969	.64	.93	.02
Belize	1960	.93	.23	.00	1970	1.01	.37	.01
Cayman Islands	1965	.77	.83	--	1969	.78	.81	--
Dominica	1960	.90	.22	--	1969	.69	.71	--
Grenada	1960	.93	.21	--	1970	.99	.42	--
Guyana	1960	.80	.46	--	1970	.67	.78	.01
Jamaica	1960	.63	.16	.01	1968	.68	.24	.00
Montserrat	1960	.90	.14	--	1969	.63	.15	--
St. Kitts-Nevis and Anguilla	1960	.88	.22	--	1970	.77	.61	--
St. Lucia	1960	.88	.10	--	1969	.84	.12	.00
St. Vincent	1960	.93	.12	--	1970	1.10	.44	--
Trinidad and Tobago	1960	.82	.30	.00	1969	.80	.31	.01
Turks and Caicos Islands	1965	...	...	--	1968	.90	.42	--

Source: UNESCO Statistical Yearbook, 1972, United Nations.

Education

The educational systems of the Caribbean region are relatively homogeneous, for they share a common language (English) and an organizational structure which is derived from the British. The primary school systems are particularly well-developed, with enrollments as high as 100% in some countries. Secondary schools, on the other hand, cater to a select minority. (See Table for all Enrollments). These schools are considered to be very good, as are those which offer technical and commercial preparation. There is one regional cooperatively financed University of the West Indies which has campuses in Trinidad, Jamaica,and Barbados.

The school systems have not been adapted to local conditions and they therefore offer little beyond basic literacy that is relevant particularly for rural pupils. Supplies and equipment are inadequate and the imported textbooks are largely alien to the local environment and experience. There is a shortage of well-trained teachers throughout the region.

Technical and vocational schools are well equipped but the training is limited to lower level craft skills and most of the teachers are expatriates. Training for middle level skills is limited to facilities on the larger islands and the proportion of graduates who emigrate is high. There is a general shortage of middle level management personnel throughout the islands and thus far the educational system has been unable to satisfy the demand. Training at the foreman level is also needed throughout the islands, for industry as well as for agriculture.

Language

English is the major language of the area. In St. Lucia and Dominica a French patios is also spoken.

The Health Milieu-Factors Influencing Health

In spite of wide divergencies in size, population density, and political organization a common culture is shared by all the countries of the Caribbean. The Commonwealth Caribbean shares common ties with the United Kingdom (either past or present) through common language and history. The parallel experiences of the Caribbean community as plantation colonies populated by African and Asian Labourers, lacking educational opportunities brought about a mixing of past and present environments to form a Creole culture.

Caribbean societies are stratified both vertically and horizontally, the former by ancestry and the latter by class. In some areas such as Trinidad the further dimensions of Catholocism and Protestantism as well as migrating African derivatives from Barbados and St. Vincent lead to increased social complexity. Despite the complexities of social composition the patterns of stratification remain fairly similar from country to country. That structure typically includes foreign educated governmental, professional and business upper class with a relatively small middle class of tradesman and proprietors; and a large lower class of the landless, labourers, under-employed and unemployed.

The most typical form of family patterns in the Caribbean is serial monogramy, a pattern in which each person has two or more mates during the course of a lifetime, one following the other. "Legal or church marriage is rare and is considered a validation of social position

rather than a statement of cohabitation. Sexual activity usually begins early for both sexes and illegitimate birth carries no stigma when the overwhelming majority of the population is illegitimate, legally at least, if not functionally. West Indians do frown on conception resulting from casual sexual contact but a family sanctioned nonlegal union of even a few weeks duration gives any resulting children a kind of local legitimacy not recognized in official statistics." This of course is of great importance when we deal later with population programming and the delivery of family planning services. Wealthy men for example are said to father 50 or more children by many mates during a lifetime.

East Indians tend to marry earlier and have a higher proportion of formal unions. Fertility is also higher among East Indians and, along religious lines, among Hindus and Moslems over Catholics. Women who have attained a higher educational level marry legally more frequently than women with less education. Fertility has not been measured against education so the correlation is unknown.

The pattern of family organization is often termed matrifocal in that women in the Caribbean culture can earn income as domestics or raising cash crops in home gardens. The demand for men's unskilled labor is both seasonal and uncertain. The household focus then is often around a grandmother and her daughters and grandchildren with no permanent male resident.

Typical housing units are termed yards, tenements, or barracks and represent multiple housing units inhabited by family members, while

many rural and some urban families live in individual privately owned or rented housing, a large number of urban dwellers are living in small clusters of housing built around a common yard or in large overcrowded multi-storied rental buildings. Several nuclear families may live in a single dwelling, blood relatives and mates, close friends, children of rural relatives, adopted children, as well as the old and debilitated who are without alternative forms of housing. Living is necessarily a cooperative enterprise with all residents contributing what they are able. A West Indian who provides what he is able when he is able, will always be able to find food and shelter and thus presents some form of informal unemployment and retirement insurance.

According to the 1960 Census data, 55 percent of private households contained 1-2 rooms. There were an estimated 1.5 - 1.9 persons per room. In 1957-58 approximately 39% of housing was in such condition that it would require replacement within 5 years.

The role of superstition is pervasive in Caribbean society. It affects the nature of mental health problems, the treatment of children, and the origin of diseases. Superstition is not limited to the lower socioeconomic strata. The close relationships between social groups and the rearing of upper class children by lower class women provides a means for dissemination of beliefs at all social levels. The origin of many beliefs is Western Africa.

Magic may take the place of political activity, agitation, organization, solidarity, or any real moves to change the status quo. Magic is a control gesture, a comfort to the individual, and an accommodation

attitude to helplessness. Fear of revenge through magic sometimes prevents people from taking actions which may be called for in certain circumstances (such as testifying against someone in court).

Mental illnesses among populations who practice magic take different directions. A higher frequency of paranoia occurs in the Caribbean region than in Europe or other areas in the Western hemisphere. A study of Curacao revealed paranoic symptoms to be present in over half of schizophrenic cases. In contrast, there is a virtual absence of depression in the region.

Among the rituals, practices, and beliefs which have been noted in the region are the following:

- Elephantiasis can be caused by eating bananas near a woman who irons the laundry.
- Leprosy will be caused by having sexual intercourse with a menstruating woman.
- Bags of herbs are sewn into garments for protection.
- Ritual baths at home or in the sea with combinations of seawater, river water, and rainwater are used for purification.
- A house must not have a number of beams which is divisible by three.
- The first food tasted by a newborn-infant should be arrowroot. On Dominica this became a serious problem because the magic qualities of arrowroot were so highly thought of that it was used as a substitute for milk. A government education campaign aided in the reduction of its use in this way.

Transportation

The location and size of the countries of this region make them highly dependent on external sea and air transportation. Sea transport moves the imports and exports which are of vital importance to these countries. The air transport system moves tourists and high value cargoes. The current transportation systems are poorly coordinated and in some areas inadequate. Improvements in routing, scheduling, sea port and airport facilities are needed throughout the region. Investments should ideally be coordinated to provide a network of major and feeder services to all countries. In order to develop an efficient air transport system, the smaller islands may lose some of their tourist business to the better served larger airports. A compensation scheme plus an adequate feeder air service would have to be developed to guarantee a more even distribution of the benefits of such a system.

Port facilities on the islands are characterized by inadequate handling equipment and a lack of warehouse space. Damage and pilferage are often caused by the double-handling of cargo and lack of storage facilities. Port expansion should be carefully coordinated to avoid overinvestment and unnecessary duplication of facilities.

The inadequate system of feeder roads has contributed to the stagnation of agricultural production in many of the countries. Road maintenance is also a problem - it has been estimated that less than 50% of the roads in the region are in good repair. Ideally future road planning will be tied to economic development planning and particularly to the development of the agricultural sector.

Communications

Newspapers - The Barbados - Advocate News is a daily available in all the islands. The Trinidad papers are also read, to a lesser extent. In addition, most of the islands publish newspapers on a daily, biweekly, or weekly basis.

Radio - Antilles, in Montserrat, is the most powerful in the area; there are 5 other stations as well - St. Kitts, Antigua, Montserrat, and Grenada (with relay stations in Dominica, St. Lucia, & St. Vincent). Radio Antilles broadcasts in English, French & Spanish.

Television - there are 2 stations, in Antigua & St. Lucia.

Telephone, telegraph, telex, and cable service are available and reliable. Less than 25% of the population have telephone service.

SECTION ONE - SECTORAL PERSPECTIVES

I. National/Regional Health Policy and Infrastrucutre

A. National and Regional Policy Objectives

Introduction

Recognizing that policy definition and the statement of goals and objectives "lies at the root of all accomplishment" the Commonwealth Caribbean Conference of Ministers Responsible for Health (CMRH) have attempted to place some priority on the identification of goals and objectives and the formulation of national and regional health policy in the Commonwealth Caribbean. The most recent CMRH meeting held in Plymouth, Montserrat in July 1976 distributed a "Draft Health Policy for a Less-Developed Country" which provided a suggested framework to member countries from which to develop a national health policy (See Appendix I-A). While each country is urged to develop individualized policies and objectives that reflect the particularities of health in the given environment the draft health policy can be seen to be very general in nature. It reflects the basic problems of almost any developing nation addressing specifically objectives in the field of personal health services (maternal and child health, communicable

diseases, nutrition, mental health, dental health and other services); the environment (water supplies, excreta disposal food hygiene, solid waste, and disaster preparedness); and supporting services (nursing, epidemiological surveillance, drug policy, laboratory services, and health education). In addition the draft policy suggests objectives in the general areas of health infrastructure, management, health care facilities and the training of allied health personnel.

Regional Policy and Objectives

The ultimate goal of regional cooperation in the West Indies is the improvement of the living standards of the people. Within the health sector the responsible regional body for the achievement of that goal is the Conference of Ministers Responsible for Health (CMRH). This body was formed in 1975 and held its second Annual Meeting in Plymouth Montserrat in July of 1976. This group was formerly named the Caribbean Health Ministers Conference (CHMC) which had its sixth meeting in 1974. The first meeting of the CMRH was essentially the seventh CHMC. The Health Section of the Commonwealth Regional Secretariat was established in 1971 with the appointment of a full-time Executive Secretary for the Caribbean Health Ministers Conference.

The difficulties in setting regional policy or regional objectives are the same that must be considered in terms of

regional program planning. The most important of these difficulties are the imbalances that exist between the richer and poorer developing West Indian nations (including Belize and Guyana). These imbalances exist not only inter-polity but intra-polity as well. There are technical and political imbalances as well as social, cultural, and economic diversities to be considered. The participants of the CMRH and CHMC support the regionalization of health sector resources but Conference discussions admitted that regionalization is not always easy to achieve.

The extent to which implementation of specific health programs is achieved depends not only on the capability of the Health Section of the Caribbean Community Secretariat but also on the capability of the Health Ministers themselves to compete for limited government resources. In this regard the translation of resolutions into actions is the key indicator. The availability of external assistance and donor resources will also play a key role in turning resolutions into effective programs.

Regional Prioritization of Factors to Modified to Improve Health Status

While individual groups such as the regional body and the epidemiological surveillance unit have categorized and prioritized factors that need to be modified in order to promote

improved health status of the Commonwealth Caribbean population for their individual disciplines, the most comprehensive and general prioritization has been accomplished by the Caribbean Ministers Responsible for Health in their July 1976 meeting.

Dr. Phillip Boyd, Chief of the Health Section of the Caribbean Community Secretariat felt that inherent in the resolutions of the health ministers conferences from 1969-76 were certain broad principles in health underlying the larger goal of regional cooperation. These principle policies represent some of the regional priority concerns of the Caricom Secretariat:

1. Those with the responsibility for developing health services need to initiate changes in present attitudes and systems in order to serve the needs of the Caribbean population.
2. Health is a basic human right and must be accessible regardless of ability to pay.
3. Health embraces a wide scope of activities and is not limited to curative services.
4. Health programmes need to be developed not in isolation but after careful study and planning.
5. National health policies must be developed with input from the health staff of the individual country.
6. Simple and inexpensive techniques (such as immunization

can contribute a great deal to the alleviation of many health problems.

7. Community involvement encourages a sense of responsibility for problem solving and contributes to its success.
8. Priority in health programs should be given to less-developed countries and to rural communities.
9. Good health involves not only traditional health services but agriculture and economic development and general education.

While these points address a wide range of issues, objectives, and priorities they represent, according to Dr. Boyd, th threads of regional policy formulation found within the resolutions passed at the CMRH.

Six outstanding priorities have been adopted by the CMRH and relayed to the Heads of Government at Caricom. The selection of the priorities is based on three factors:

1) the number of people affected;
2) the susceptibility of the problem to remedial and preventive measures; and
3) its social and economic importance.

The priorities themselves emphasize the preventitive rather than the curative and concentrate on:

"1. The environmental health situation, especially in relation to the safety of drinking water supplies and the disposal of excreta; this is largely because of repeated outbreaks and many deaths from gastroenteritis and typhoid.

2. Special health services for the protection of the West Indian mother and her child.

3. The strengthening of management, which is now characterised by apathy and inertia in some of the countries.

4. Programmes of health education, which are needed to help the people of the Caribbean to decide for themselves the most important community health problems and to feel responsible for solving them."[1]

Specifically tweleve priroity health issues were identified by the 1976 conference in response to the request of the Commonwealth Caribbean Medical Council for guidance in attempting to select fields of research. The twelve issues (Appendix I-A-2) are essentially elaborations of the above four general priorities.

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[1] Conference of Ministers Responsible for Health, Draft Declaration on Health by the Heads of Government Conference, March 1977. Responsible for Health, July 1976.

Despite the existence of a regional organization which speaks as the official regional body of health ministers there appears to be no firm statement of policy other than broad recommendations on areas of mutual concern. As is explored in the appendices of this paper, many of the difficulties in attempting to develop regional objectives stem from the wide divergence in economic status between the various island populations. The resolutions of the CMRH give an indication of the primary areas of concern for the regional body and could be construed as regional policy in the broadest sense of the term.

For this reason it seems to be worthwhile to expand on the resolutions adopted by the most recent CMRH and identify resolves, requests, and recommendations contained within these resolutions.

A. Maternal and Child Health Services

The conference supported and requested progress reports on the Strategy and Plan of Action for Strengthening the Maternal and Child Health Services both from the national health administrations involved in the plan and PAHO which assisted with funding and technical assistance.

B. Control of the Sexually Transmitted Diseases

The members of the conference resolved to seek the cooperation of the Caribbean Epidemiology Center (CAREC) in

developing a regional program to work to control the sexually transmitted diseases.

C. Regional Diabetes Control Programme

A request was made to the Secretary-General of Caricom to set up a regional program through PAHO, UWI, and CFNI for the control of diabetes through staffing, teaching, training and administering such a program.

D. Regional Programme for the Control of Cardio-Vascular and other Chronic Non-Communicable Conditions

The conference resolved to formulate a regional program for detecting and treating these disorders prophalactically.

E. The Handicapped Child

A recommendation was proposed that measures be included in MCH services to assist in prevention, early detection and early intervention in relation to the handicapped child.

F. Environmental Health Strategy

The conference approved a schedule of activities and programme of work which will define the status of environmental health in each country and determine sources of financial aid for addressing these problems over the next 10 to 15 years.

G. Aedes Aegypti Eradication/Control Programmes

Recalling the 1975 outbreak of dengue and dengue hemorrhagic fever in the Caribbean the conference has called for renewed

activity in eradication/control through PAHO/WHO technical and financial assistance.

H. Veterinary Public Health

The ministers requested the member countries to note the conference's resolutions regarding meat and milk protection, aquatic meat quality control, epidemiologic surveillance of food-borne diseases, and poultry protection.

I. Disaster Preparedness

The need for regional concern and organization of disaster preparedness plans was stressed by the conference ministers.

J. Epidemiological Surveillance

The conference urged continued support and cooperation of health administrations with regard to CAREC's activities. It placed emphasis on obtaining data on immunization status and the incidence and prevalence of intestinal parasites.

K. Regional Food Plan

Reaffirming support for the work of CFNI, the conference participants outlined specific nutritional considerations in regional food planning.

L. Regional Drug Policy

Recommendations from the ministers for reducing drug costs included bulk purchasing by a regional authority, formulation of a generic formulary and the abolition of pharmaceutical patents.

M. Health Education

Disappointed at progress in health education along the lines of resolutions passed in 1973, 1974, and 1975 the ministers recommended the appointment of "an action oriented health educator" who would actively promote the earlier recommendations of the conferences.

N. Management of Health Services

The conference reaffirmed the high priority assigned to health services management and approved projects for developing infrastructure through policy and procedure manuals with regional focus.

O. Medical Education

The conference asked U.W.I. and Caricom to take steps to jointly ensure that (a) medical education in the Caribbean is strictly related to the needs of the Caribbean population; (b) trained health personnel have a real desire to serve in the Caribbean; and (c) health workers recognize their commitment to serve all sections of the Caribbean population.

P. Veterinary Medical Education

The conference recommended national administration participation in a regional Ministers of Agriculture conference to present recommendations on the formation of programs in veterinary medical education in the Caribbean.

Q. Nursing Education

Expressing concern over the relevance of nursing education to the needs of the Caribbean the ministers affirmed support of changing the traditional nursing training functions and recommended reciprocity and accreditation cooperation among the national nursing education programs.

R. Allied Health Personnel

Due to a reduction in UNDP funding for allied health personnel training the ministers conference recommended that each national government assume responsibility for funding their own training awards seeking external assistance as necessary. The use of the newly established St. Vincent Training School as a regional resource for the less developed countries was to be investigated by the secretariat.

S. Maintenance of Health Care Facilities

Slow progress in obtaining funding for facility maintenance resolutions presented in past conferences prompted the ministers to renew support of the project and to give high priority to obtaining funds.

T. Health Legislation

Supporting the ongoing project for health legislation development the conference recommended continued support and urged individual health administrations to adopt legislation over

three years in line with individual objectives and needs.

NATIONAL HEALTH POLICIES

The development of individual health policies for the developing countries of the Commonwealth Caribbean in particular remains in the formative stages. As is seen in Appendix I-A-1, the second Conference of Ministers Responsible for Health (CMRH) supported the development of a draft health policy for a less developed country. This draft policy provides at the very least a backbone for infrastructual development and national priority for the expenditure of the scarce resources allocated to the health ministry. As a launching pad for individualizing the needs and priorities of the individual polities in the Caribbean, the draft policy addresses the broad range of health services and resources in an attempt to "arouse interest and stimulate activity...by the health administration."[2]

Due to the limited resources available for the completion of this background study it is not possible to determine what progress has been made by the individual countries in adopting and "customizing" the draft national health policy presented at the July 1976 CMRH meeting in Montserrat. Health policies in the more developed Caribbean states (Trinidad and Tobago, Jamaica,

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[2] Caribbean Community Secretariat, Paper CMH 76/2/11, June 9, 1976 Montserrat, Caribbean.

Barbados and Guyana), are more a matter of definitional hierarchy than firm statement of commitment. In this broader sense priorities and policies are almost interchangeable. Policy in essence at least in the sense utilized by Jamaica and other developing Caribbean states involves commitment to stated priorities of resource concentration. Objectives on the other hand indicate quantifiable measures to be achieved through the prioritization of resources. The Jamaica Syncrisis offers an excellent example of these distinctions in outlining the Current Objectives of MOHEC and the ensuing footnote.[3]

Policy development then on the national level is just beginning to be formulated for the less-developed countries of the Caribbean. The larger more developed countries have begun both policy definition (priority setting) and objective setting. The development of health infrastructure in all these countries is dependent to a large extent on how well these policies and objectives can be derived as well as the practicality of their use. A health policy, like a health plan that sits on the shelf is wasted effort, but one that is utilized and is the product of the joint effort of those who will implement it is an essential

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[3] Jamaica Syncrisis, Office of International Health; Department of Health, Education and Welfare, p. 85.

part of an effective health administration.

National Prioritization Of Factors To Be Modified To Improve Health Status

The level of national priority setting in health is seemingly tied closely to the level of national development and infrastructure/planning capability within the respective Ministries of Health. In Barbados, Trinidad and Tobago, and Jamaica the National Development Plans detailed the objectives for the various health related sectors. In the smaller and less-developed of the Commonwealth States either no National Development Plan was available or existed. In the St. Kitts-Nevis-Anguilla (1973-74-75) Annual Report of the Health Ministry key areas of concern to the Health Ministry were presented. These may well approximate factors which other of the smaller Caribbean islands feel should be prioritized. Among the factors that are of immediate concern to the St. Kitts-Nevis Ministry are:

1) A lowering of the infant mortality rate;
2) Increased attention to the nutritional status of the population at risk.
3) "Cold" chain improvements for effective immunization covera
4) School Health and school dental services;

5) Family planning services especially to "stop school-girl pregnancies";

6) Veneral disease control.

According to the Barbados National Development Plan (representative of the more developed Commonwealth Caribbean states) the main thrust of policy will be to continue and accelerate the integration of the preventive health services with the curative services and to further improve the efficiency of institutional and non-institutional health-care. The program of the Government of Barbados during the 1971-77 Development Plan period was designed to achieve the following objectives:

1) Improve environmental sanitation;
2) Reduce the incidence of leptospirosis, venereal disease and those infectives diseases for which there are specific preventive techniques;
3) Enforce the regulations made under the 1969 Health Services Act and update as needed;
4) Improve health care in industry;
5) Expand and integrate the Public Health Nursing services;
6) Improve maternal and child health;
7) Improve the nutritional standards of the community;
8) Develop rehabilitation and geriatric services;

9) Improve inpatient and outpatient care;

10) Improve the care of the mentally ill;

11) Improve the dental health of the community

12) Improve the quality and rationalize the allocation of technical and administrative personnel;

13) Encourage cooperation with the other countries and universi in the Commonwealth Caribbean.

The health priorities and objectives then of the more developed and less developed of these countries appear in line with their relative developmental states. In Barbados the concern is to refine and improve existing services while the priorities in St. Kitts-Nevis are to develop and improve programs in the more basic health services.

For the region as a whole a summary of those factors which need to be ameliorated in order to improve health status has been developed by the Conference of Ministers Responsible for Health. These factors are seen in Annex I-A-2, a summary account of the health problems of the Caribbean Community. The priority concerns of the regional body were listed above.

ANNEX I-A-1

DRAFT HEALTH POLICY
FOR A LESS DEVELOPED COUNTRY

The ultimate purpose of the Government's health policy is to get a better life for all the people of _____ .

Recognising that health is the basic right of every citizen, the Government intends to work out a system under which all the people of _____ shall receive health care, irrespective of their ability to pay at the time of receiving attention.

The Government's aim is not merely the absence of disease. We intend that the working people of _____ shall be fit and productive and able to acquire and use new skills, that school children shall be fit and able to benefit from their education and that their physical and mental development shall not have been permanently impaired by malnutrition in infancy. Our policy is to provide the health services with dynamic and creative management, both technical and administrative. Our policy is to eliminate the serious environmental health hazards in _____ and to control the communicable diseases associated with that environment.

Recognising that the institutions take care of only a small proportion of the people who need health care, we shall put emphasis on community (i.e. non-institutional) care.

Greater emphasis will be placed on the preventive aspects of health. Our policy is to provide special care for all the mothers and children of _____ . Our aim is that our people shall be emotionally well-adjusted, individually, in families and as a community, and free from dependence on alcohol or tobacco. Above all, we shall help our people to determine for themselves the most important health problems

of _____ and to play their part in solving them; we are resolved to imbue our people with a feeling of responsibility for making the changes in habits and behaviour that are needed to solve the health problems so that ultimately health in _____ will be achieved by the actions and efforts of the people themselves.

We shall work out a health system which is appropriate to our particular needs, to the overall policies of the Government and to the resources of the State.

We shall seek health for our people, not only through the traditional types of health services, but also through social and economic development, including agriculture and general education.

We shall first carry out a careful study of the existing health situation and decide upon our priorities.

We shall identify the constraints that are impeding the efficient operation of the health services and the achievement by our people of health in the broad sense as outlined at the beginning of this statement.

We shall define more precisely at a later date the objectives of the health services but are including in the present statement a preliminary account of our objectives in each of the main health fields: Personal Health Services, the Environment, Supporting Services and the Health Infrastructure.

We shall prepare a strategy for achieving these objectives in the shortest possible time.

We shall make a continuous evaluation of the situation and of our efforts from the very beginning and report promptly each year to the people of _____.

Our broad objectives under the various branches of the health service are as follows:

A. Services to Persons

1. Maternal and Child Health

We are committed to implement the regional Strategy and Plan of Action for Strengthening the Maternal and Child Health Services.

2. Communicable Diseases

It is our policy to immunise children under five years of age against polio, measles, diphtheria, whooping cough and tetanus; to maintain the smallpox-free status of and to eradicate the mosquito which transmits yellow fever, dengue fever and dengue haemorrhagic fever.

See also under C.2 below - Epidemiological Surveillance.

3. Nutrition

The Food and Nutrition policy for which will be prepared by the Nutrition Committee will bring together our activities in agriculture, education and health.

4. Mental Health

Inherent in the new programme in this field will be provision for better care of mental patients, for the treatment of such patients by a psychiatrist at the Health Centre and for the changing of attitudes of our people in the direction of greater acceptance of mental patients and understanding of the problem.

5. Dental Health

T The dental health services will be reformed in the direction of prevention, restoration and dental health education as well as the training and utilisation of auxiliaries.

6. Other Services

We shall prepare programmes for control of the following:

a) Communicable diseases not dealt with in A.2, for example, enteric diseases, tuberculosis and the sexually transmitted diseases.

b) Chronic diseases, namely, diabetes, high blood pressure and heart disease.

B. The Environment

1. General

We shall take part in the comprehensive regional approach in 1977 to the health hazards of the environment.

2. Water Supplies

We shall seek to provide that within ten years every dwelling house in shall have piped dr nking water, inside the house, for twenty-four hours a day.

3. Excreta Disposal

It is our policy to ensure that within ten years every dwelling house in shall have sanitary arrangements for excreta disposal

4. Other Services

We shall prepare programmes to strengthen/initiate services in the following:

a) food hygiene
b) solid waste
c) disaster preparedness (health aspects)

C. Supporting Services

1. Nursing

It is our policy to set up in a system of nursing which clearly defines the role of nursing, the categories and numbers of nur staff and the educational programme required to achieve our objectives.

2. Epidemiological Surveillance

We shall create a system that guarantees prompt information about the incidence of diseases and their causes, utilising for this purpose funds available at the CARICOM Secretariat.

3. Drug Policy

We are participating in the regional programme for reducing the cos of drugs and for developing a drug policy for the Caribbean Community.

4. Laboratory Services

The laboratory facilities both for clinical medicine and for community health work shall be upgraded.

5. Health Education

We shall further develop the health education programme that was recently initiated by the Government with the aim of obtaining greater community participation in the solution of the health problems.

D. The Health Infrastructure

1. General

It is the policy of the Government to participate, in general, in regional projects.

It is the policy of the Government to cooperate with CARICOM, PAHO/WHO, CIDA, Project HOPE and any other agency that is interested in helping us to achieve our objectives.

It is the policy of the Government, in recruiting personnel, to give preference to national personnel, but where no suitable national candidates are available, short-term contracts will be offered to suitable non-nationals, while awaiting the availability of trained nationals.

2. Management

It is our policy to strengthen the process of health planning and programming and the system of health information, including statistics about the health situation and the health services. Recognising the importance of

timely and complete information for planning, administering and evaluating, the provision of adequate facilities for processing data will be considered a priority.

We shall integrate the preventive and curative services.

We shall re-examine carefully all our current expenditure on healt to make sure that it is economically administered and consider what additior resources are needed.

3. Health Care Facilities

The existing health care facilities will be upgraded, and after careful examination of our priorities, we shall consider the preparation of plans for the construction of a modern hospital.

It is our policy to improve the utilisation of health centres by attracting and retaining staff and making the services continuous and accessible.

We shall participate in the Regional Project for the Maintenance of Health Care Facilities.

4. Training of Allied Health Personnel

We shall develop a programme for the training of allied health personnel and take part in the Regional Project, giving particular attention to the inclusion in the health team of community health aides and other auxiliaries.

5. Health Legislation

We shall bring our health laws up to date, utilising the services of the CARICOM Adviser in Health Legislation.

It must be again stated that this health policy statement will be revised regularly. As more data become available it will be possible to give more detailed proposals and to make changes as indicated by the information.

APPENDIX I-A-2

SUMMARY ACCOUNT OF HEALTH PROBLEMS OF THE CARIBBEAN COMMUNITY

1. The greatest causes of sickness and death are poor environmental conditions and the resulting communicable diseases, namely, gastroenteritis dysentery and typhoid. In addition, cholera remains a serious threat.

2. The chief dangers in the environment arise from insufficient and unsafe water supplies; insanitary excreta disposal and poor food hygiene come next in importance. The other factors in the environment have a distinctly lower priority.

3. Mothers and children make up 65% of the whole population and have high rates of sickness and death.

4. Combined malnutrition and diarrhoeal disease in children under two years of age account for most of the deaths in this young age group, but also for one-fifth to one-third of deaths for all ages.

5. Twenty to thirty per cent of all deaths in the Caribbean Community are due to communicable diseases, and one-third of these deaths are due to diseases that could easily be prevented by immunisation.

6. The sexually transmitted diseases are on the increase, and tuberculosis remains a major problem.

7. Diabetes and high blood pressure are common and often undetected and uncontrolled until they give rise to grave complications that strike down adults at the height of their productive capacity.

8. Mental illness constitutes about one-half of the total volume of illness, and the mental health services are sadly deficient. Drug abuse falls under this heading, but in the Caribbean Community the most important drug problems are alcohol and tobacco smoking.

9. Diseases of the teeth and gums are universal, and the care of the mouth is seriously deficient. The dental services are given over to extractions and little is done for prevention and the conservation of teeth.

10. All the countries are infested with the mosquito that transmits yellow fever and dengue in populated areas. The virus that causes yellow fever is found in the forests of Guyana and Trinidad and nearly all the South American countries and could at any time spread through the Caribbean Community.

11. There is a lack of knowledge and of a sense of responsibility and participation in community health, and the majority of the countries do not have programmes in health education, which would remedy this state of affairs.

12. There are serious weaknesses in the management of the health services, in the availability of trained staff and in the supply and maintenance of health care facilities. The delivery and cost of health care have become serious problems. Medical education is, in large part,

ANNEX I-A-3

CONFERENCE OF MINISTERS RESPONSIBLE FOR HEALTH (1975)

IMPLEMENTATION OF RESOLUTIONS*

RES. NO.	8	9	10
COUNTRY	MATERNAL AND CHILD HEALTH SERVICES	DENTAL HEALTH	CONTROL OF SEXUALLY TRANSMITTED DISEASES
BAHAMAS	Ante-natal care implemented. Items B-Y target dated for 1975 thru' 1980 with item K-2 slated for 1984. B/feeding and fam.life education emphasised in schools	Looks forward to recommendations of Dec. 1976 Conference in Antigua	Action yet to be initiated on a comprehensive service. Follow-up Clinic held wkly at the P.H. Dept. Screening practised on pregnant women, food handlers and blood donors
BARBADOS	Arrangements made to start measles immunisation at Child Hlth. Clinics. National C'ttee to study abortion laws submitted report	Not applicable to Government	Health Education continued but no major changes were introduced
BELIZE	Prog. operated along with SPACGEN under C'ttee comprising Paeditrician, MOH & Welfare Officer. No commitment made on up-dating abortion laws	Awaiting word on proposed strategy and Plan of Action relating to Dental Health	Clinical and lab. facilities adequate. Health education measures form part of new thrust in this programme
BERMUDA	Hlth. education of public. Family life education, promotion of b/feeding and immunisation progs. are implemented by Health Clinics	Emphasis placed on preventive dentistry and pilot trials with sealants and fluoridation started	Emphasis placed on the education, the reporting and the follow-up of cases
BRITISH VIRGIN ISLANDS	Special emphasis continues to be given. Recommendations embodied in Report being implemented	Trying to obtain services of dental hygienist from Canada on a temporary basis	Treatment of V.D. is provided at all clinics and also by private practitioners

*Countries which have not reported are: Antigua, Dominica, Guyana, Montserrat, St. Kitts/Nevis/Anguilla and St. Vincent

RES NO.	8	9	10
GRENADA	Coordinator appointed. MCH strategies discussed with appropriate personnel. Maurice Pate Seminar arranged through CFNI	Dental surgeon appointed to fill 1 vacancy. 2 places in T'dad Dental Nurse prog. obtained. Prog. for training Dental Assistants	Possibility of recruiting a Medical Officer of Health for this programme is still being pursued
JAMAICA	Tremendous strides have been made	Ministry trying to get the Faculty established. Ministry aware of meeting organised	Regulations for new Public Health law nearly finalised. Director taken post-graduate courses in U.S. These two steps will facilitate preventive and curative methods
ST. LUCIA	C'ttee set up to implement strategy. There was mass immunisation prog. for school children. Special attention to promotion of breast feeding and importance of family planning		Schedules of revised treatment have been distributed to hospital, health centre and private practitioners. Importance of providing early treatment stressed
TRINIDAD AND TOBAGO	Auxiliaries employed to assist at Clinic sessions. Legislation requiring immunisation with DPT introduced. Community Health Assoc. formed in Caroni	Trinidad and Tobago represented at first meeting of Planning Group on Dental Hlth.	New clinics opened in five areas. Screening is continued for ante-natal patients and various categories of worker in Govt. service and private enterprise

RES. NO.	11	12	14
COUNTRY	ERADICATION OF LEPROSY	REGIONAL PROJECT ON DIABETES MELLITUS	THE HANDICAPPED CHILD
BAHAMAS	No specific action taken. Not an important public health problem locally	Organisation of a specific programme on diabetes is under consideration	Representative participated at Jamaica Conference. Copies of Resolutions adopted and under study
BARBADOS	No progress since last Conference	Formation of Diabetes Assoc. re organisation of out-patient clinics. Plans considered for institution of Diabetic Register at Queen Elizabeth Hosp.	Barbados represented at Conference. Recommendations of Conference are under consideration
BELIZE	This is not a problem	No additional action to that started in last report seems indicated	Director of School for the Handicapped attended Conference. Health Ministry in communication with her on follow-up action
BERMUDA		Survey of diabetes taken by Hospital Board and the T.B., Cancer and Health Assocs. to conduct bi-annual free screening tests throughout March	Ministry represented at Conference by Government Psychologist
BRITISH VIRGIN ISLANDS	Disease is unknown in the B.V.I.	Looks forward to the publication of the "Diabetic Handbook" and to any assistance from external funding agencies	Was unable to send representative to Conference. Fort Charlotte Children's Centre in Tortola administered by BVI Branch of Red Cross Society and carrying out creditable work
GRENADA	Same as 10	nil	The Government Psychologist attended the Jamaica Conference
JAMAICA	Special post created at level of Principal Medical Officer for well-qualified doctor who has taken charge of leprosy problem	Subject being followed up	Represented at Meeting

RES. NO.	11	12	14
ST. LUCIA	Supports proposal for joint approach to external agencies for funds to mount project for eradication of last vestiges of leprosy		Council for handicapped appointed. Government donated building for use as a school. Special courses in education for handicapped. Screening of children begun
TRINIDAD AND TOBAGO		Advisory Committee met on three occasions	Represented at this Conference by a Specialist Medical Officer (Paediatrics)

RES. NO.	16	17	18
COUNTRY	ANIMAL HEALTH AND VETERINARY PUBLIC HLTH.	ROAD TRAFFIC ACCIDENTS	CARIBBEAN EPIDEMIOLOGICAL SURVEILLANCE
BAHAMAS	No action taken on establishment of Vet. Public Health Unit. Vet. services attached to Ministry of Agriculture and Fisheries	Action has been deffered	Necessary action taken to secure formal Government agreement to amendment to Section 4.2.3. Revised budget accepted and increase 20% in budget paid
BARBADOS	Efforts being made to recruit a Director for the Animal & Human Hlth. Project which is under Ministry of Health	No progress since last Conference	Contribution for 1976 has been budgeted
BELIZE	Zoonosis C'ttee staffed jointly by Min. of Hlth. and Agriculture. Medical and Vet. Labs capable of diagnosing cases of diseases in animals transmissible to man	Cooperation of Public Service and private concerns to review problems arising out of increasing incidents and severity of road accidents	The Ministry concurs
BERMUDA	Do not intend to create a Veterinary Public Health Unit. Zoonosis C'ttee is in existance & comprises officers of the Dept. of Health, Agriculture & Fisheries	Legislation introduced to Parliament which will stiffen penalties for traffic violations and calls for compulsory use of safety helmets by all motor cyclists	Decided to continue support for the Caribbean Epidemiology Centre
BRITISH VIRGIN ISLANDS	No Vet. surgeon in B.V.I. Livestock Adviser appointed. Need for an abattoir. Zoonoses have low incidence	Special attention being given to youthfull motor cyclists. Traps set up to enforce speed limits	Delegate sent to attend the CAREC Conference in T'dad in December 1975. Useful information as obtained
GRENADA	Result of an application to PAHO/WHO for fellowship to train a sanitarian in Vet. Pub. Health is awaited	nil	Appointment of Dr. Comissiong on CAREC Council approved. Material assistance from CAREC provided and assistance with investigation of communicable diseases
JAMAICA	Formed Vet. Public Health Unit. Several Conferences held	Nothing specific done	Nothing specific done. Had tremendous help from CAREC during outbreak of Parathion poisoning

RES. NO.	16	17	18
ST. LUCIA	No Vet Unit. Vet Services under Ministry of Agriculture work closely with Pub. Health Section of Ministry of Health to achieve objectives	Constant patrols on busy roads and enforcement of regulations against offenders	
TRINIDAD AND TOBAGO	Vet. Public Health Unit responsible for implementing programmes for control of zoonoses and diagnosis of diseases of animals	Establishment of Liaison with voluntary bodies and associations with an interest in traffic accidents. Evaluation of efficiency of control measures	Amendment to Sec. 4.2 of agreement is under consideration. Accepted budgetory increase of 20% to CAREC in 1976

RES. NO.	20	21	29
COUNTRY	HEALTH EDUCATION	MEDICAL EDUCATION	HEALTH LEGISLATION
BAHAMAS	Main thrust of Health Education is in Govt. schools. Fam. Life Education devised as special subject in all schools	Action not yet taken	Adviser paid two visits during 1975. Specific requirements will be discussed later in Port-of-Spain
BARBADOS	Health education continues to be delivered by health team. Booklet with answers developed and distributed to heads of depts. visiting schools	Plans continuing to establish clerkships in community medicine (final year) and Social & Preventive Medicine (2nd yr.)	Paramedical Professionals Act enacted to provide for registration of certain professions supplementary to medicine
BELIZE	The "10 Vital Questions" given adequate publicity. 'Caribbean' substituted for 'West Indian'.	Little purpose would be served by registering objection to firm decision of University Council on pre-clinical intake	Drafts from Adviser are being studied by the Ministry
BERMUDA	Intended to continue to place emphasis on educational aspects of functions of all health workers		Public Health Act, 1949, being reviewed with aim of introducing amended act to Parliament during 1976
BRITISH VIRGIN ISLANDS	Efforts to obtain services of suitably qualified Health Education Officer so far proven fruitless	Considers that UWI (Council) should be permitted to make own decisions concerning increase of intake of medical students and expanding pre-clinical facilities	Min. of Health working closely with Adviser to achieve revision and updating of Dangerous Drug Act, Lunacy and Mental Treatment Ordinance
GRENADA	Considerable activity by Health Education Officer in all health programmes	nil	Adviser visited and discussed draft legislation with appropriate persons
JAMAICA	Bureau of Health Education is extremely active	No developments to report	Cooperated with Adviser on visit to island
ST. LUCIA			New comprehensive Pub. Health Act No. 8/75 passed by Legislature. New regulations being drawn up by A.G., Adviser in Health Legislation and Pub. Health Officials
TRINIDAD AND TOBAGO		Considering implications of decisions of Council of UWI with respect to pre-clinical intake of students taking into consideration its own plans for development	Ministry of Health will continue to cooperate with Adviser in Health Legislation

RES. NO.	30	32	33	34
COUNTRY	C/WEALTH CARIBBEAN MEDICAL RESEARCH COUNCIL	RESOLUTIONS OF 27TH WHA OF SPECIAL INTEREST TO CMRH	RES. OF 19TH PAN AMERICAN SANITARY CONF. OF SPECIAL INTEREST TO CMRH	4TH C/WEALTH MED. CONFERENCE SRI LANKA - NOV. 1974
BAHAMAS	No budgetary provisions have been made. Exemption from income tax of expenses does not arise			
BARBADOS	1975/76 contribution already paid. Arrangements underway to pay 1974/75 contribution	Intensifying health education prog. for children, etc. Construction of new Bridgetown Sewerage System	Considering proposals for reorganisation and expansion of community nursing services. CERO coordinates plans for hurricane relief, etc.	No progress since last Conference
BELIZE	Situation is not entirely applicable in Belize			
BERMUDA				
BRITISH VIRGIN ISLANDS	Intends to continue annual subscription. Would appreciate advice on obtaining income tax exemption	Health Education. B/feeding actively encouraged. National Insurance Scheme recommended. Health and Environment, etc.	Water supply tested daily. Emphasis on continuing education. Improvement of quality & quantity of nursing staff. Emergency relief.	No maintenance engineer at hosp. Essential that lay Manager be appointed. Training required in Hlth. statistics
GRENADA	nil	noted	noted	noted
JAMAICA	nil	Agrees with all aspects of Medical Care but resources do not permit complying with them all	same as 32	General nature. No specific action required
ST. LUCIA	Matter of tax free expenses for medical personnel attending CCMRC meetings referred to legal advisers for study			
TRINIDAD AND TOBAGO	Steps being taken to ensure payment of contribution to CCMRC for 1976	Process of studying Resolutions relative to Trinidad & Tobago	Resolutions under consideration	No proposals put to the C/wealth Secretariat for co-operation in fields mentioned

ANNEX I-A-4

RESOLUTION NO.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
						SOUTH CARIBBEAN HEALTH IMPLEMENTATION		DIVISION COMPLIANCE (1974) OF RESOLUTIONS							
COUNTRY	GASTROENTERITIS & DEHYDRATION AS EMERGENCY UNDER THE TERMS OF AHC	MATERNAL & CHILD HEALTH SERVICES	POLICY ON FINANCE	MENTAL HEALTH SERVICES	ALCOHOLISM	ASSESSMENT OF SOLID WASTE SERVICES	MATERNAL CHILD HEALTH LEG.	COST OF DRUGS	ROAD TRAFFIC ACCIDENTS	CARIBBEAN EPIDEMIOLOGICAL SURVEILLANCE	HEALTH EDUCATION	NATIONAL HEALTH SERVICES	ADVANCED NURSING EDUCATION	EDUCATION AND TRAINING OF ALLIED HEALTH PERSONNEL
BARBADOS	C'tion. appointed to implement the plan of action.Duration of Programme set for 6½ years 1970 - 1976	No action could for by Government	Costing of action of school children 13-14 yrs.Import duty on drugs and chemicals removed December 1970	2 dental officers appointed for family, school nursing on dental matters & Fluoride content underway	Treatment facilities being expanded and Alcoholic Unit in planning stage. Implementation deferred	Plans for installation of refuse shredding plant now well advanced.Calculation from for tends waste implemented in 1970	Not a signatory of the relative Agreement	Prescriptions of drugs by generic names in operation for 12 years. Entry of other brands not excluded	No follow-up action as yet	Whip. morbidity & mortality data furnished regularly CAREC	Health education activities implemented in schools temporarily	Action deferred	2 yr. Programme for B.Sc. Nursing now put into effect. Certificate discontinued	Negotiations underway to establish Division of Health Sciences
BAHAMAS	National Nutrition Survey conducted among government age children 10-4yrs.1.Programme. In early childhood education started	Not applicable to Government	Formation of Bahamas Assoc. - Alcoholic registered being constituted at the G.C. Hosp.	Identification of water location not implemented. Consideration given to a project for Central Andros. Ghana	No programme since last Conference	Joint project with UNDP & Pan/WHO to establish Pulverization Plant for disposal of solid waste	Ratification of Agreement for establishment of Caribbean Reg. Drug Testing Lab. approved by Govt.	National Formulary Committee re-elected. Drugs listed by generic names	Under consideration by Ministry of Health and Welfare	Standard forms used. Weekly morbidity and mortality data sent to CAREC	Latest health data continuously being interpreted with a view to establishing priorities	No progress since last Conference	Cert. Programme continuing at UWI. Introduction of 3 year B.Sc. not yet implemented	Courses started: Post Graduate Environmental Pre-health Sanitary Public Health Inspection Pharmacy Dental and Occupational Therapy established
BELIZE	Western Pole Seminar recently held and implementation should finish by 1980. action in progress under C'tion funded by Pan/American	Action initiated. 2 programmes - one local and one regional coverage. 3. However, funding considered tentative with SPHERE	Diabetic Clinic conducted yearly at City Hosp. and clinic of personnel sent to other smaller areas. Academic Statistics pursuing Dip. Course in Community Statistics	Additional provision for employing more dentists and supply of equipment. Dental Surgeon pursuing course in Dental Pub. Health. Dental Nurse on. being trained in Trinidad	Prog. still in in-Prog. Continuing support received especially from some unexpected donations	Public Health Nurses drafted proposals for effective collection and disposal of waste as follow-up of Workshop on Management of Solid Waste	Accepted proposal Financial provision for it has been made	Endeavour to bulk purchase in bid of th a view to problems arising from unavailability of timely dates and spiralling cost	Survey of Public Nurses get together to review problems arising from increasing incidences and severity of Road Traffic Accidents	Whole Government is now covered this Resolution is fully implemented	Activities every week inservice. Official assigned Relative responsibility for this programme	Strengthening of public clinic services and the control of the pest control clinic always	No further action on the part of the Ministry since Indicated	2 now trained on P.H. Inspector-1975 and 3 nurses from P'Cove with B.N. Qualifications. Dr. P.H. Nurse attended 3 wks. course in Fed. and Child Welfare Services in U.S.A.
BRITISH VIRGIN IS.	Fall in incidence of gastroenteritis in children under 2 yrs. No Fatalities in 1976. Reinstation is no problem	Special contracts given to these services. Recommendations in Report of Seminar in Belgium, April 1970 now being implemented	Special Clinic for diabetic patients held once a week. Patients referred to Peoples Hosp. for Lab. tests & in-patient treatment	School children and old people receive free treatment at Dental Clinics. Fluoridation of water supply is being considered	Assessment, treatment and rehabilitation of alcoholics in new part of South. Mental Hith. prog.	It is proposed to institute special charges for collection of refuse from hotels, business premises, etc. the main sewerage scheme for Road Town has started	Willing to contribute subject to it the major port. In formal of setting up this new service	It is hoped that a central fund will soon be set up in the Caribbean Area from which bulk supplies may be obtained on favourable terms	Meetings held between Chief of Police and Health Dept. to discuss the problem. Steps not to enforce speed limit	Use action for reporting of communicable diseases has recently been instituted. Liaison also established with CDC Lab. in Puerto Rico to investigate incidence of dengue fever and Salmonella	Health Education Committee set up and considerable work in this field. Unable to get services of Health Education Officer	National Health Insurance Scheme to include hospital benefits will soon come before the Legislative Council	Hopes to send a candidate on an early date for training in Nursing Admin.	1 now trained on P.H. Inspector-1975 and 3 nurses from P'Cove with B.N. Qualifications. Dr. P.H. Nurse attended 3 wks. course in Fed. and Child Welfare Services in U.S.A.
CAYMAN	Coordinator of MCH appointed. Strategies: MCH & Environmental & Rehabilitation in children discussed with appropriate personnel. H. Pole Seminar arranged through CFNI for May 17 and 18	none	nil" - apart from routine measures	Dental Hygienist appointed in 1971 and comp. 2 places in T'dad for Sch. Dental Programme obtained their Allied Health Personnel Prof. Prog. for training of Dental Assists. under consideration by Project HOPE		Possibility of provision of heavy equipment by external agencies being pursued	Accepts in a signatory to the Agreement	Accepts in a signatory to the Agreement	nil	Government has approved the appointment of Dr. L.H. Condonton on CAREC Council. Material assistance from CAREC - equipment and lab. supplies provided. Assistance from CAREC with investigation of communicable diseases.	Steps has been considerable activity by the Health Education Officer in all health programmes and other programmes with health implications	nil	nil	Places obtained for 2 trainees in Environmental Therapy in Allied Health Ser. Project. Places obtained for 2 trainees in the Dental Nurse Project in T'dad through C.M.F.P. Possibility of providing Pre-Health Sch. Training Prog. in Grenada being explored
MONTSERRAT	Considered to non exist for the Infant Welfare Prog. to be taken on still, national & communal	Comprehensive & Territorial services 1 multi-purp clinics continue. Post-natal clinics started	Provision of drugs free to all diabetics	Dental Health Plan have been formulated and should be commenced by September	nil	Land acquired for garbage disposal by Landfill. Sheet metal by waste bank and sand all	Agreed in principle for setting up bank & laboratory	Use of generic names. No adverse comments intended with co-operation both buying of drugs	No new actions taken	CAREC Report distributed to medical, dental, nursing and sanitation personnel to obtain better reporting	Health education being done at schools. District clinic based by Dominica and P.H. Nurse	None envisaged at present. Proposed nurses, school children and the old persons from clinics	nil	1 Grenadian on a Project at CAFI, Jamaica, Leaving in two diploma in Pharmacy, Lab. Tech. & one training in P'Cove and Jamaica
TURKS & CAICOS	Experimental Health Services. MCH Services, Immunization, Health Education. Economic & operational assessment	Antenatal care. Under-weight cont. Post-natal care. Family Planning. Immunisation. Pre School Child.	Provision of drugs. Diabetic Clinic. In process of developing a programme for nurse practitioners to assist in Police up-run. In patients with hypertension and diabetes	Additional nurse to be attached to Health Centres. Public Hlth. Nurses visit schools for examinations and advice actions in clinics on dis. hygiene. 30 dent. ass. available by 1976. Minor supply in St. Joseph Fluoridated	Alcoholics Treatment Centre of 20 beds. Active out-patient prog. run by Psychiatrist, trained nurse and admin. officer. Active Isolation Institute	Land acquired for Landfill in use.Inter-Ministerial Committee Eng Cities. appointed to study difficulties by consultancy firm on P.H. Management. Public education in S.W. disposal	Signed the Agreement establishing the Regional Drug Testing Laboratory	Controlled and up to advice Ministry on drug standards. Schedule of drugs. condition of sales and inspection of stocks held by Pharmacists. Control of price.	Establishment of liaison with voluntary bodies and associations with an interest in traffic accidents	Epidemiological Surveillance Unit works closely with CAREC, also staff of Public Health Laboratory	Health Education policy on Health Education. Unit exists in training of personnel in Health Education	Possibility of a National Health Service is still under consideration	Govt. has agreed in principle to in the Project for training of Allied Health Personnel

B. ORGANIZATION AND ADMINISTRATION OF THE NATIONAL HEALTH SYSTEMS

Organizational Structure

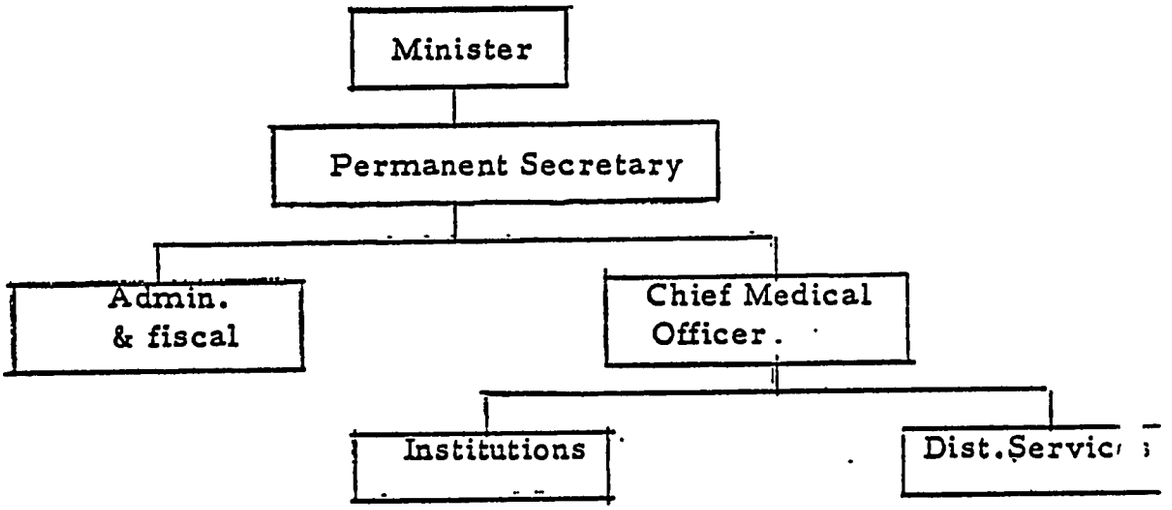
In the smaller of the Commonwealth Caribbean countries the organization of the Ministries of Health is usually quite simple. The permanent secretary reports directly to the Minister of Health. A director for administrative and fiscal affairs and a chief medical officer report to the Permanent Secretary. The Chief medical Officer divides responsibility between institutional services and district services.

Table I-B-1 shows the organizational chart of the Ministry of Health. As can be seen there is not an elaborate infrastructure and the concept of services regionalization is not applied. The levels of complexity in the health infrastructure vary both according to the level of development and the size of the population.

In contrasting the organizational structure of one of the more developed and populous islands (Barbados) to that of one of the smaller less populous island groups (St. Kitts-Nevis-Anguilla) it is possible to more fully understand the levels of authority delegation, and responsibility in each sector. In Barbados the health ministry is overseen by the Minister who is charged with the responsibilty for providing all health services.

Table I-B-1

Organizational chart of the Ministry of Public Health



There is not an elaborate infrastructure in these small countries. All are as the above, with some having more defined organizational lines. There is no regionalization.

There are no local authorities. The Chief Medical Officer i responsible for all technical aspects of the service. Though th general policy of the Ministry is to integrate curative an preventive services they are still broadly divided. Th preventive services are divided in three geographic areas eac under the control of a Medical Officer of Health supervising team of Public Health Nurses who staff a Health Center and visi sub-centers. Clinics conducted are antenatal, child healt venereal disease and tuberculosis. In addition there is a Publi Health Inspectorate, which is responsible for environmenta services. The inspectorate like the Public Health Nursin Service is directly responsible to the Medical Officers of Healt who in turn are responsible to two Senior Medical officers o Health working directly under the Chief Medical Officer. Although the island is divided into three public health areas; the St. Michael area is further divided in two parts so there are four Chief Public Health Inspectors. Each of their areas is divided into two zones under a senior inspector and each zone is subdivided into a number of districts each of which the responsibility of a District Inspector.

Quarantine services are carried out at the seaport and airport by a team of Public Health Inspectors who are responsible through a Medical Officer of Health and a Senior Medical Officer

of Health to the Chief Medical Officer who is the Quarantine Authority.

The Curative Services are divided into Hospital, Out-Patient and Domiciliary Services. In addition services in communicable diseases, MCH, school health, nutrition, chronic diseases, cancer therapy, mental health and dental health are offered as integrated in both preventive and curative aspects. Hospital care was provided at ten government hospitals consisting of one acute general hospital, one psychiatric, two maternity, one leprosarium and five district institutions with three private general hospitals. Outpatient facilities are provided at the main general hospital for specialized clinics, casualty and general practioners' cases, the mental hospital and the district maternity hospitals. The three main health centers and six sub-centers concentrate on preventive services. In addition, there is an out-patient clinic in each of the eleven parishes for welfare patients who are unable to pay for medical attention.

In St. Kitts-Nevis-Anguilla on the other hand to service a population roughly one quarter the size of Barbados a significantly smaller infrastructure and organization has been developed. All health services are under a centralized administration with the offices of the Minister, the Permanent Secretary and the Chief Medical officer being responsible for

policy, program and operation decisions. Administrative functions fall to the Permanent Secretary and Technical functions to the Chief Medical Officer. Authority has been delegated to senior officers for the operation of some institutions.

For public health purposes the State is divided into eight health districts in St. Kitts and four in Nevis. Districts are staffed according to the size of the population they serve. Curative services are available at two hospitals, one home and one mental ward in St. Kitts and a small hospital in Nevis. There are twenty-one outpatient dispensaries and maternity and child welfare centers in the island group from which preventive medicine and environmental sanitation activities are carried out.

Thus it can be seen that servces are limited and combined in the lesser developed island groups while the infrastructure is more detailed in the more populous and developed areas. Division of Curative and Preventive services appears to be the major form of administration. Administration is centralized as well as the authority and decision-making functions.

Management of Health Services[1]

At the end of 1975, the Secretary General of the Caribbean

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[1] From a paper of the same name prepared by PAHO/WHO and presented to CMRH, July 1976.

Community addressed the Director of the Pan American Sanitary Bureau pointing out the need of making new proposals to the Ministers of Health for strengthening the management of health services and requested the assistance of PAHO/WHO on the preparation of strategies and plans after a careful review of the existing situation.

In response to the requests of the Secretariat, the Pan American Health Organization developed in 1973 a two-year Continuing Education Programme, whose main purpose was to expose top health administrators to management techniques by means of designing an executing projects on priority problem areas.

Within that work plan, it was agreed that an Advisory Group would be convened in St. Kitts to evaluate the present management situation of health services and to formulate the bases for a programme on management development.

The Advisory Group selected the following problem areas as deserving special attention:

- There is a lack of positive attitude towards change and towards development;
- There is no clear definition either of national health policies or the realtionship between the health sector and other sectors of social and economic development;
- Health priorities are not clearly established;

- The health planning process is undeveloped and is not integrated into the national planning process;
- Health legislation is out of date and inadequate in scope;
- The existing data collection practices do not produce accurate and timely information to facilitate good planning and management;
- Over-centralization of decision-making prevails;
- The organizational structure of health services is not adequately designed for efficient delivery of health care;
- Cost consciousness is not wide spread in the health team, and this results in inadequate utilization of resources, including the maintenance of physicial facilities;
- There are no systematic training programmes at the various level and subsystems.

Programme for Developing the Infrastructure of the Health Services in the Commonwealth Caribbean Countries

Objectives of the Programme

I. Ultimate Purpose

The ultimate purpose of this program is to provide each Ministry of Health with dynamic and creative management, capable of giving to the health staff clear and vigorous direction towards the goals decided upon by the Government and the Minister of Health.

II. Immediate Objectives

In compliance with Resolution 17 of the Fifth Caribbean Health Ministers Conference, the immediate objectives are:

- To integrate health planning into the national development planning process;
- To identify health problems, define priorities and formulate health policies;
- To design a health system in each country by strengthening the process of administrative reform, developing the operating capacity of health services and strengthening the information system.

III. Work Plan

Immediate Activities

1. Promotion of support at the decision-making level for the necessary changes in the health services.

2. Formulation of Project for Design and Implementation of Manuals on Policy and Procedures for the Operation of Health Services, to be initiated in two LDCs and extended at once to other countries.

3. Execution of training programmes to support the implementation of the manuals referred to at 2 above.

4. Conduct of a regional seminar on health planning for economists of national planning units, with participation of

health planning staff.

5. Formulation of procedures for integrating health planning with national developing planning.

6. Conduct of a two to three week regional seminar for senior health administrators to review the problem areas already identified and devise solutions.

7. Re-establishment of Middle Management Courses as formerly conducted by PAHO/WHO.

Subsequent Activities

1. Formulation of a programme of administrative reform in each Ministry of Health.

2. Conduct of surveys for identifying problems and constraints and formulating the appropriate projects.

3. Assessment of conditions to determine whether or not they are conductive to a viable project.

4. Conduct of training programmes on management for health administrators and executives.

HEALTH DATA COLLECTION AND ANALYSIS[1]

With the new emphasis on health planning in nearly all the Caribbean area the need for adequate health and vital statistics

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[1] From a "Report to the Caribbean Health Ministers Conference on the Status of Health Statistics in the English Speaking Caribbean." January 1971, Dr. David Morris, CHMC 15/71.

is becoming evident; for reliable heath and vital statistics provide measures of the level of health and disease, which are indispensable for the planning and evaluation of curative, preventive, and rehabilitative heath programs and in the orientation and development of medical research. At present in most of the countries the health and vital statistics are not current and in certain cases incomplete and at times inaccurate. These deficiencies were highlighted with the collection of data for the four-year projection in each area. These projections usually prepared by the Ministries with the assistance of PAHO personnel are serving as a basis for developing the program of PAHO assistance to the countries as well as for country planning; since in many instances in the Caribbean the available systems or the personnel for producing the data needed did not exist, personnel from PAHO coded and tabulated the information from basic records and calculated the desired rates. Whatever health and vital statistics are available at present are produced, mainly to supply, as best possible, certain international organizations (PAHO,UN,etc.) with information they request, rather than to be utilized as a basis for effecting meaningful health planning or for more efficient administration and evaluation of their respective health services.

In most of the countries, at present, there are serious

deficiencies in the quantity and quality of statistical information on health needed for management and planning of health programs, and whatever data may be available are not always current.

Only 6 of the 14 countries investigated have health statistics units in the central office of the Ministry responsible for health affairs and of these only 2 or 3 provide a broad range of information and services on a regular bsis. In only two countries are there health statistics units comprising of two or more persons, and in only one country is there a person with a University degree working in the field. In the specific area of hospital medical records, only in some of the larger general hospitals are there organized medical records departments.

In few of the countries, persons who have received training in health statistics or medical records were not assigned duties related to that training, and in most countries there is a steady loss of persons trained at the intermediate level from health statistics and medical records departments. In the few countries where mechanical data processing facilities are available, very little use is made of them to process data from health statistic units and medical records departments. More use has been made of them to process vital statistics data from Registrar Generals'

Departments.

There is no uniformity of forms and reporting procedures in the collection and reporting of data among the countries, which makes comparison of conditions and curriculum development of health statistics courses difficult.

There are substantial advisory and data processing resources in certain departments of the University of the West Indies and in the Central Statistics Offices of the larger territories. The rare attempts at collaboration have not been productive and the responsibility for these failures is probably shared by the health ministries and the other organizations.

Regional Project in Health Legislation

The Conference of Ministries responsible for Health at its meeting in February, 1972, recognising health legislation to be of great importance because of the direct relationship between the health of the population and the economic development of the Region, adopted a resolution in which it noted that its Standing Committee had identified such legislation as a problem area in the Region and that the Chief Medical officers had reported that the health laws of many Caribbean countries were out of date and in need of "unification".

In consequence of this resolution, the Health Legislation Project, a Project of the Caribbean Community Secretariat in

cooperation with the Commonwealth Fund for Technical Cooperation and the University of the West Indies commenced on 8th October, 1974 with the appointment of an Advisor in Health Legislation.

Among the constraints with which this Project operates are the managerial problems that confront health administration, the shortage of legal draftsmen and the lack of coordination between the health administration, on the one hand and the legal authorities on the other.

The Project has as its ultimate purpose the improvement and protection of the health of the peoples of the Region through the enactment of appropriate health legislation as a supportive arm to the management of health services.

The more specific objectives of the Project are to update existing health legislation and to harmonise, where possible, this legislation.

Priorities

The priorities of the Project are as follows:

1) basic enabling public health law, including law relating to communicable diseases and subsidiary legislation dealing with the more important aspects of environmental health;

2) law relating to the health of mothers and children

and law relating to:

3) nutrition;

4) food and drugs;

5) mental health;

6) veterinary public health

7) control of narcotic drugs;

8) pesticide control;

09)radiation protection.

Model draft Public Health Acts for countries where both Central and Local Governments participate in the health administration and for countries with Central Governments alone, have been settled by the Group and cirulcted to all the countries concerned for necessary action or information, as the case may be.

The Group is currently working on a new Mental Health Act for the Less Developed Countries which should be settled by the end of May, and circulated thereafter, as well as laws relating to food and drugs, and the registration of doctors and dentists; while the Advisor is currently researching a new nutrition law.

The Activities of CFNI

The entire program of the Caribbean Food and Nutrition Institute is planned with a view to serving the CARICOM Countries which are signatories to the Agreement by which the Institute receives its basic financial support. Because the business of food and nutrition does not fit wholly into a single discipline,

the activities of the Institute relate to Ministries other than Health, e.g. Agriculture, Education, Community Development and Planning, but maintain a strong health orientation.

The following summarize the level of activities of CFNI:

1. Food and Nutrition Policy
   a. Training
   b. Data Collection and Analysis
   c. Development of Policy
2. Support to Nutrition Units within Countries
3. Training in Nutrition and Related Subject
4. Special Projects
   a. Regional
   b. National
5. Information Services
6. Operational Research

A full report on CFNI activities in this area is contained in CFNI Report CFNI-J-62-76 especially prepared for the Meeting of the Technical and Scientific Committee on the Conference of Ministers Responsible for Health.

Health Education in Schools[1]

In October, 1975 a Health Education Seminar was held in Guyana under the sponsorship of the National Science Research Council. Among those who attended were Health Educators from various parts of the Caribbean.

One area of concern discussed was the role and development of School Health Education programs as part of the overall Strategy to strengthen National Health Education services in their efforts to disseminate health knowledge and promote positive attitudes and practices within the national population. Although the discussions focused primarily on the Guyana situation, almost all the Health Educators within the region have been making prodigious efforts in this area, - efforts ranging from curriculum design, health literature and audio-visual materials for both teachers and pupils, to in-service training for teachers, and with good reason.

A review of the population strucutre of nearly, if not all territories within the Caricom region, indicates that approximately 40-50% of the population are under 16. This age group falls within the school system.

Further when it is considered that many of our health programs are hindered in a significant part by the ignorance and

[1] Paper prepared by Miss Patricia Brandon, Snr. Health Education Officer, Guyana, CMH, 76/2/37.

thus poor health habits of most of our adult population, most of whom grew to maturity at a time, when health concepts and behaviours taught in schools were limited or non-existent, it is imperative that the schools be utilized as a vital channel for teaching both the informational and behavioural aspects of health to this captive audience. Last but also just as important there is urgent need to recognize within our educational system that the teaching of health in all its aspects - physical, mental, social, is as an essential part of preparation for living and contributing to national development, as Mathematics and English.

Despite these worthwhile efforts to develop school health education or health teaching programs within the territories, these programs are yet to be systematically incorporated within the school system as compared with other subjects. In other words such areas as policy, clear objectives, standard curriculum outlines, learning materials, training programs within teacher colleges, need to be developed, operationalized, supported at all levels within the school system, and through the collaboration of both the Ministries of Health and Education. Adequately trained personnel need to be procured where non-existing and limited in numbers to ensure the relevant teaching program. Such systematisation if accomplished on a territorial basis, could help to further developments in terms of making health an

examination subject, on which matter the Caribbean Examinations' Council has been requested to explore and advise.

In view of the above, the following actions are recommended for consideration.

1. The joint formulation of a clear policy at Ministerial level between the Ministries of Health and Education concerning the place of health instruction in the Curriculum of all schools and the teacher training institutions, and the role and functions of each agency in the implementation of such a program.

2. The development of standard curriculum outlines - appropriate in design, structure, content, method, to the needs of each territory.

3. The development of training programs, curricula, in School Health Education for Teacher Training Institutions. In this respect it is requested that the Caribbean Ministers of Education include School Health Education among the regional prirorities in Teacher Education.

4. The development of text matter for Teachers and School Children within territories and appropriate audio-visual materials with a view to regional standarization in the future.

Regional Drug Policy: Preliminary Report on the Project[1]

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[1] Presented to Conference of Ministers Responsible for Health, June 1976, CMH 76/2/25.

The Conference of Ministers Responsible for Health, at their Meeting in Guyana in 1972, adopted a resolution expressing their concern at the increasing cost of drugs, pointing out that it was a factor seriously affecting the delivery of health care to the population.

The project started on March 1, 1976, with the appointment of a pharmacist through a grant from the Canadian International Development Agency.

The project is primarily concerned with obtaining safe and effective drugs at the lowest possible cost. Priority has therefore beeng given to the purchase of selected drugs by a system of master-contract.

Initially this project will be concerned mainly with purchases by Govenment Institutions. It is however, envisaged that in the smaller territories, where the number of private pharmacies is small, their requirements will be integrated with those of Government. The cost of these items will therefore be reduced to both the Government and the patient - the ultimate consumer. A further reduction in costs may be achieved by the use of generic as opposed to brand name drugs, provided it is shown on the basis of scientific and technical data that the two are equivalent.

Drug Quality Control

The Agreement for the establishment of a Regional Drug Testing Laboratory was signed in Jamaica on June 16, 1975. This laboratory is an integral component of a Regional Drug Policy. It will be responsible for the pharmacological adn microbiological testing of drugs submitted by participating countries.

Plan for Caribbean Epidemiological Surveillance

The purpose of epidemiological surveillance according to Resolution 19 of the Caribbean Health Ministers Conference is "to have up-to-date information on the disease situation and conditioning fctors together with interpretation, utilization and dissemination of these data." Until the formation of the Caribbean Epidemiology Centre (CAREC) no means for such a system existed. Prior to its formation the responsibility lay with the individual countries to provide epidemiological surveillance. Responsibility for developing and maintaining a national surveillance system still must remain with the individual country as well as support of the regional surveillance systems. Such a system must be consistent with prevailing global ad continental surveillance.

In the planning for CAREC it was decided by the health ministers that initial surveillance should be limited to a number of important diseases - prevalent and preventible - that could be managed through existing facilities. These facilities could be improved as the need arose rather then beginning with an overly ambitious program where resources and personnel were not available.

Two levels of surveillance are implied through a regional

epidemiology center; one is national surveillance the other international. Each country is responsible for operating and maintaining basic surveillance facilities. Within each country the epidemiological surveillance program should exist within the existing health service so that collection and retention of data can be coordinated with the MCH, medical care, sanitation, malaria and Aedes eradication programs. According to the CMRH plan a unit should be established in every country that would collect process and disseminate information weekly. The International Surveillance center (CAREC) collects data from the participating countries, analyzes the data and prepares summary reports for distribution.

Each country should develop surveillance through all or some of thee following elements:

1) Mortality registration
2) Morbidity reporting
3) Laboratory investigation
4) Individual case and epidemic field investigations
5) Surveys
6) Animal resevoir and insect vector distribution studies
7) Utilization of biologies and other drugs
8) Knowledge of the population and environment

The central surveillance Center has been located at the Trinidad Regional Virus Laboratory. The activities of this central facility are to provide epidemiologists for regular technical assistance sessions in the participating countries; 2) provide a central Caribbean Laboratory with supporting staff in bacteriology, virology, parisitology, and serology; 3) to assist in surveillance programs and reporting through data anlaysis and distribution (epidemiologic and demographic); and, 4) provide for communication and shipment and support of national epidemiologic and laboratory services is also seen as fundemental to the continued success of the Regional Epidemiological Centre.

Health Administration and Management

Many of the management problems facing the Commonwealth Caribbean comes as the result of the British Colonial experience. Expatriate managers and administrators filled roles that had to be filled after independence by nationals. National infrastructure was not developed because no real motivation for its development was seen. As the areas achieved independence the West Indians who were primarily filling clerical roles were called on to make decisions and plan programs. Current surveys of the situation indicate that the situation has not changed dramatically in the past 10 years.

Dr. S. Kelley Moseley in his discussion of training health administrators for the Caribbean[1] points to five factors that have contributed to this continuing situation. These factors are closely interwoven with the entire social and economic development process.

The first factor, of course, was that following independence the responsibility for providing health care was shifted to the local governments. Prioritizing development programs such as

[1] S. Kelley Moseley, "Training of Health Administrators in the Commonwealth Caribbean". Terminal Report AMRO 6910, Pan American Health Organization, U.W.I., p. 2.

improving roads, housing, and tourism became a prime concern. High priority was placed on pressing issues with health, education, and management placed at a lower priority level.

Second, those who became managers, as mentioned above, were generally trained as operators, clerks or administrors and had never been forced to make policy-level decisions. Decisions were forced, then, at the higher Minister or cabinet level. Efficiency and management development both suffered.

The public administrators were also generalists and had no background in health, housing, or management. Thus generalists were put in the position of making decisions proposed by the technical staff. Ill-feelings often resulted and further impeded efficiency.

The fourth factor that contributes to present health management difficulties results from outmoded policies and procedures that were originally formulated during the colonial period.

Finally, career development and promotion has been historically based on seniority rather than merit evaluations often creating a lack of iniative on the part of all managers.

Governments of the Caribbean have difficulty spreading scarce resources among competing demands. Often the Ministries of Housing, Education, Public Works, Transportation, Agriculture,

Tourism, Industrial Division and Defense are given higher priority than the Health Ministry. Development philosophy plays a key role in resource allocation.

The problems discussed above have been further complicated by what Dr. Moseley sees as increased demand for services by the population. The new government was seen in a form of messianic role delivering a changed economic, social and cultural order. Demand increased as efficiency decreased and the system became even less responsive to the demands and needs of the community. The colonial systems maintained a static attitude towards change while the community demanded dynamic action from the beleaguered public administration/civil service.

The colonial governments were highly centralized especially in the decision-making function. The institution level decision-making necessary for day-to-day operations is impeded by this centralized structure. This can be seen specifically in the manner in which the Ministry of Health makes many of the decisions for the hospitals. According to Dr. Moseley, those who manage the institution then are not given ample opportunity to develop into efficient managers but rather become more reliant on the centralized decision-making function. Lack of clear understanding of organizational objectives and the policies and programs that assist in achieving these objectives leads to

inefficient management.

Delegation of authority and responsibility from the central government has not taken place. A good example of the problems associated with this process is typically the Finance Ministry. In general the only function allocated to the lower level would be that of accounting. Thus the hospital or other health institution is typically given both a budget and the instructions on how to spend it. The responsibility then for program prioritization and objective setting is not within the Ministry of Health but rather within the Ministry of Finance. Similarly the personnel decision function is handled by the central authority as well.

A large proportion of those efficient and capable managers who are available for government services are drawn into the more progressive ministries such as Tourism or Economic Development. The same occurs with the allocation of resources. "Those managers that remain are ill-equipped to deal with the overwhelming task of organizing and managing a national health system. They simply withdraw into an apathetic shell or rules and red tape where security and power reside. The result is that innovation and initiative are stifled".[2]

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[2] Ibid., p. 5.

Historically, the assignation of specialized tasks and roles to various classes of employees within the Ministry of Health framework has not taken place. The role of the nurse for example was one where a variety of tasks often unrelated to nursing are assumed. Similarly the physician spent much time carrying out tasks that could well have been achieved by another employee. Specialization is now however being seriously pursued. The lack of adequate "job descriptions" and task assignment, as well as inefficient supervision has hampered the success of a well-meaning approach. The result is often a large groups of individuals who all know a great deal about a wide variety of subjects but lose the perspective of organizational goals and objectives. In Jamaica, especially, Dr. Moseley points out that the demands for worker "status" by unions has led to further difficulty in proper assignation of responsibilities and tasks.

The planning of health programs is handled almost exclusively by the top level ministry personnel. Input is not often solicited from mid-level managers, the community, or outside experts. The result is that the plans often fail due either to lack of grass-roots support or reliable data. The role of the manager becomes one of supervision of programs rather than the planning, controlling, directing, coordinating, or evaluation of those programs.

. "In regard to planning, the course of action is generally vague and indefinite. The goals as such are either quite general or otherwise not measurable. There appears to be a lack of organizational proportion. Specialized services such as training, accounting, and personnel are divorced from the functional activity. Top management is burdened with detail and at the lower levels there exists redundant staff whose functions are ill-defined, who have little responsibility and few incentives to improve."[3]

Several major areas of management concern are demonostrated in the area of supplies and equipment management. In an effort to make supplies and equipment available an often repeated case is the ordering of specialized equipment from Europe or North America but no one has the technical expertise to either install the equipment, maintain it, or sometimes even operate it. Efficient planning and the development and implementation of uniform purchasing regulations, inventory analysis, and utilization trend stocking would aid significantly in this useless waste of resources.

The systems of distribution and ordering are similarly lacking in efficient planning, demand forecasting and logistical

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[3] Ibid., p. 10.

support. With local centers depending on central depot distribution, stock outs and overstocking is due to lack of informed personnel on "economic ordering quantity" methodology. Slow paper work and communication further slows this process. Regionalized bulk purchasing of supplies could significantly reduce costs and standardize unnecessarily complex procedures.

This then gives some idea of the problems and difficulties in the management and administration of health services in the Caribbean region. These difficulties seem to stem from 1) cultural/traditional management patterns; 2) lack of trained and upwardly mobile administrators and managers; and 3) the low priority of health in the general social and economic development framework. Overcoming these barriers will require trained personnel who have the initiative and skill to overcome the inherent difficulties in the management system and political hierarchy.

II RESOURCE AVAILABILITY

A Health Manpower Training and Development

There is direct correlation between the quality of the delivery of health care and the quantity and variety of health manpower available to provide that care. The provision of sufficient manpower is a major concern facing the Caribbean countries. Adequate care necessitates a wide variety of skills and expertise that is expensive to train and diffiult to retain. Salaries and the cost of training health manpower comprise by far the largest proportion of the health care dollar in both developed and developing nations. The preparation of sufficient manpower, then, in adequate variety, at the lowest cost occupies one of the priority concerns of health administrators and health planners.

The composition and distribution of the manpower resources needed differs by each country's demographic and socio-economic development, as well as by the relative complexity of the individual countries health service system. Within the manpower planning process itself both health needs and demands must be considered on the one hand, while supply, distribution, utilization and productivity must be analyzed in response. In the Caribbean the lack of sufficient information on the 1) number

of currently available and active health personnel by categories at professional, technical, and auxilliary levels; 2) their geographic and specialty distribution; 3) the functions they perform in relation to the training they need; 4) their migration patterns; 5) the numbers and types of types of educational institutions; and 6) their training capacity; is a serious problem making health manpower planning that much more difficult.

The limited data presented here is incomplete but gives a broad picture of the manpower currently available in the Caribbean. Various health manpower training programs, and medical and nursing education projects in process or planned to meet the growing demand for health manpower are indicated by donor, national, or regional agency in the section of this paper, entitled "Donor Assistance in the Health Sector".

Manpower Resources in the Commonwealth Caribbean

Physicians

As Table II-A-1 indicates, the total number of physicians in the Commonwealth Caribbean is 1706, which is an overall ratio of 3.4 physicians per 10,000 population. This rate is significantly lower than the North American ratio of 15.5 physicians per 10,000; as well as the Middle and South American ratios of 6.1 and 7.4 respectively. It is also interesting to note that except for Haiti no lower physician to population ratio exists in the

TABLE II-A-1

NUMBER OF PHYSICIANS, DENTISTS, GRADUATE NURSES AND NURSING AUXILIARIES WITH RATIOS PER 10,000 POPULATION, BY COUNTRY

Area	Physicians			Dentists			Graduate nurses			Nursing auxiliaries		
	Year	Number	Ratio	Year	Number	Ratio	Year	Number	Ratio	Year	Number	Ratio
Antigua	1972	23	3.2	1972	5	0.7	1972	129	17.7	1972	20	2.7
Argentina	1972	49 950	20.9	1972	13 300	5.6	1972	14 621	6.1	1972	23 650	10.0
Bahamas	1972	158	8.3	1972	29	1.5	1972	428	22.5	1972	332	17.5
Barbados	1972	140	5.8	1972	15	0.6	1972	501	20.9	1972	314	13.1
Belize	1972	38	3.0	1972	6	0.5	1972	85	6.7	1972	107	8.5
Bermuda	1968	65	12.9	1968	30	6.0	1968	214	42.5	1968	123	24.4
Bolivia	1972	2143	4.1	1972	685	1.3	1972	853	1.6	1972	359	1.7
Brazil	1969	47 250	5.2	1969	26 611	2.9	1970	a) 8152	0.9	1970	a) 104 260	11.2
Canada	1972	34 509	15.8	1972	7611	3.5	1972	114 349	52.3	1971	106 934	48.9
Cayman Islands	1967	2	2.0	1964	1	1.1	1967	6	6.0	1967	8	8.0
Chile	1973	5 572	5.4	1973	3 875	3.8	1973	2 324	2.3	1973	19 527	18.9
Colombia	1972	10 317	4.6	1972	3264	1.5	1972	2700	1.2	1972	14 990	6.7
Costa Rica	1973	1323	7.0	1973	263	1.4	1973	870	4.6	1973	3 180	16.8
Cuba	1968	7000	8.5	1966	1 451	1.8	1970	4637	5.5	1970	7 189	8.5
Dominica (b)	1971	13	1.8	1971	2	0.3	1971	112	15.6	1971	32	4.4
Dominican Republic	1972	2 220	5.2	1972	516	1.2	1972	317	0.7	1972	3012	7.0
Ecuador	1970	2080	3.4	1970	253	0.4	1970	601	1.0	1970	3110	5.1
El Salvador	1972	952	2.5	1972	372	1.0	1972	974	2.6	1972	2684	7.1
Falkland Islands	1970	4	20.0	1970	2	10.0	1970	5	25.0	1970	5	25.0
French Guiana	1970	40	7.8	...	...	...	1970	90	17.6	1970	103	20.2
Grenada	1971	33	3.4	1971	5	0.5	1971	130	13.5	1971	118	12.3
Guadeloupe	1971	174	5.2	1971	45	1.4	1971	306	9.2	1971	275	8.3
Guatemala	1971	1208	2.3	1971	244	0.5	1971	751	1.4	1971	3673	6.9
Guyana	1972	191	2.5	1972	20	0.3	1972	641	8.5	1972	510	6.8
Haiti	1972	412	0.8	1972	85	0.2	1972	407	0.8	1972	1086	2.1
Honduras	1972	760	2.9	1972	199	0.7	1973	316	1.1	1973	1647	5.9
Jamaica	1971	752	4.0	1971	88	0.5	1971	1066	5.6	1971	196	1.0
Martinique	1971	214	6.3	1971	75	2.2	...	...	...	...	...	...
Mexico	1970	33 981	6.9	1970	5 101	1.0	1970	10 230	2.1	1970	26 620	5.4
Montserrat	1972	6	5.0	1972	2	1.7	1972	c) 52	43.3	...	...	...
Netherlands Antilles	1968	120	5.6	1968	29	1.3	1968	268	12.4	...	...	...
Nicaragua	1972	1385	7.0	1972	286	1.4	1972	489	2.4	1972	1915	9.6
Panama	1972	1070	7.0	1972	155	1.0	1972	1059	7.0	1972	2119	13.9
Panama Canal Zone	1972	136	30.2	1972	7	1.6	1972	235	52.2	1972	352	78.2
Paraguay	1972	1071	4.1	1972	214	0.8	1972	309	1.2	1972	813	3.1
Peru	1972	8023	5.5	1972	2542	1.8	1972	5040	3.5	1972	11 357	7.9
Puerto Rico	1972	3271	11.6	1972	531	1.9	1972	5009	17.8	1972	5 338	19.0
St.Kitts, Nevis and Anguilla (d)	1972	18	3.8	1972	4	0.8	1972	132	27.6	1972	2	0.4
St. Lucia	1972	33	2.9	1972	2	0.2	1972	125	11.0	1968	41	3.6
St. Pierre and Miquelon	1967	5	9.6	1967	1	1.9	1967	11	21.2	1967	3	5.8
St. Vincent	1970	18	1.8	1970	3	0.3	1970	103	11.6	1970	67	7.5
Surinam	1972	180	4.3	1972	19	0.5	1972	395	9.4	1972	513	12.2
Trinidad and Tobago	1971	432	4.2	1971	52	0.5	1971	2 394	28.0	1971	471	4.6
Turks and Caicos Islands	1962	2	3.3	1963	1	1.7	1963	23	38.3	1963	15	25.0
United States	1971	318 699	15.5	1971	103 750	5.0	1971	748 000	36.3	1971	1 327 000	64.4
Uruguay	1971	3170	10.9	1971	1331	4.6	1971	988	3.4	1971	5 956	20.4
Venezuela	1972	11 222	10.3	1972	2760	2.5	1972	e) 7985	7.3	1972	b) 17 702	16.2
Virgin Islands (U.K.)	1973	7	5.4	1973	1	0.8	1973	17	13.1	1973	21	16.2
Virgin Islands (U.S.)	1967	68	12.1	1963	13	3.0	1963	96	19.5	1963	116	26.4
Northern America		353 278	15.5		111 392	4.9		862 574	37.8		1 434 062	62.9
Middle America		55 987	6.1		9588	1.0		31 736	3.5		60 932	6.6
South America		141 213	7.4		54 876	2.9		44 684	2.3		203 555	10.5

(a) Data refer to institutional and public health services. (b) Personnel in government service. (c) Nurses without mention of level of training. (d) Data for St. Kitts-Nevis. (e) Data for nurses in private practice not completely reported.

western Hemisphere than in Dominica, St. Vincent, and the Cayman Islands. The highest ratio for the Commonwealth Caribbean is in Barbados where a ratio of 5.8 physicians per 10,000 population exists. Even this ratio is lower than most of the other developing countries of Latin America.

While these ratios alone do not fully describe either the level of health services available to the population, their distribution, or the quality of care delivered; they do demonstrate that the availability of the highly skilled physician as a leader of the health care team is extremely limited.

Table II-A-2 breaks down the number of available physicians by specialty. As would be expected, the numbers in general practice are the largest with many countries having only 1 or 2 physicians in such specialties as pediatrics, obstetrics, psychiatry, or radiology. The lack of specialty physicians in these first two categories must necessarily affect the mortality and morbidity in maternal and child health. Similarly the availability of only one or two psychiatrists to a country affects the levels and quality of mental health care available to the population. The pattern continues in each of the specialities.

When physician data is examined geographically by areas of practice (rural/urban), the scarcity of physician services is

TABLE II-A-2

Distribution of Physicians by Specialty, by Country, 1972

Area	Total	General practice	Surgery	Internal medicine	Pediatrics	Gynecology and obstetrics	Psychiatry	Radiology	Anesthesiology	Pathology	Public health	Others	Not stated
Antigua	23	13	2	1	1	1	1	1	1	-	1	1	-
Argentina	53 684	4 758	14 352	21 831	4 615	4 678	...	1 341	...	389	...	1 720	-
Bahamas	158	118	10	8	2	3	4	1	4	3	2	3	-
Barbados	140	94	8	5	3	3	2	5	3	2	8	7	-
Belize	38	26	3	1	1	1	-	-	2	1	3	-	-
Bolivia	1 702	277	713	133	109	107	26	15	14	15	31	362	-
Canada	34 509	14 302	3 309	2 253	1 007	1 135	1 486	1 134	1 257	726	230	7 578	2
Colombia	9 468	2 032	139	299	614	399	...	150	329	121	16	...	5 369
Costa Rica (a)	691	178	103	32	33	52	20	6	3	3	...	261	-
Dominica (b)	13	7	1	1	-	1	1	-	-	1	1	-	-
Dominican Republic	2 220	1 292	43	240	107	94	28	23	26	10	35	322	-
Ecuador	2 080	953	370	...	174	160	18	...	...	...	...	92	313
French Guiana	40	28	3	-	-	-	1	1	1	-	2	3	1
Grenada	33	21	2	1	1	1	1	-	2	-	3	1	-
Guadeloupe	174	98	13	-	7	7	1	3	4	-	24	17	-
Guyana	191	156	8	4	1	2	1	1	1	1	8	8	-
Haiti	412	284	19	21	16	13	7	8	17	-	-	27	-
Honduras	780	560	24	11	38	28	5	9	10	4	23	68	-
Jamaica (b)	173	112	9	5	3	6	2	-	3	1	26	6	-
Martinique	214	125	12	-	6	7	6	7	3	1	11	27	4
Mexico	25 602	19 162	807	...	726	313	85	205	409	101	721	502	1 982
Nicaragua	1 357	875	35	35	106	63	20	11	37	6	15	154	-
Panama	1 070	548	66	18	85	41	36	16	13	15	9	223	-
Panama, Canal Zone(b)	136	66	6	12	6	8	7	5	2	5	6	13	-
Paraguay	1 023	82	155	151	82	102	21	15	17	7	7	152	232
Peru	8 023	1 854	923	385	762	658	200	160	130	273	417	2 191	-
Puerto Rico	3 271	1 609	173	178	261	212	123	60	63	45	15	527	-
St.Kitts-Nevis-Anguilla (c)	18	8	1	1	1	1	1	1	1	-	2	1	-
St. Lucia	33	12	3	13	-	-	1	-	1	-	2	-	1
St. Vincent	16	12	2	-	-	-	-	-	-	-	2	-	-
Surinam	180	124	14	10	3	8	3	2	3	1	1	11	-
United States	318 699	73 194	70 009	16 202	19 918	19 770	22 279	14 039	11 557	11 103	2 975	27 353	-
Northern America No.	353 208	87 496	73 408	48 455	20 925	20 905	23 765	15 473	12 814	11 829	3 205	34 931	2
%	100	24.8	20.8	13.7	5.9	5.9	6.7	4.4	3.6	3.3	0.9	9.9	
Latin America No.	112 903	35 484	18 010	23 396	7 763	7 469	626	2 156	1 153	1 005	1 391	6 599	7 902
%	100	33.8	17.2	22.3	7.4	7.1	0.6	2.1	1.1	1.0	1.3	6.3	

(a) Physicians employed in hospitals and rural health centers. (b) Physicians in Government service. (c) Data for St. Kitts-Nevis.

SOURCE: Health Conditions in the Americas, op cit, p. 78

further exaggerated. - Table II-A-3 shows the urban/rural ratios in some of the more developed of the Caribbean countries. The unbalanced situation is undoubtedly similar or more pronounced in the less developed countries.

Table II-A-3

Number of Physicians and Ratios per 10,000

Population by Area of Practice

COUNTRY	TOTAL PHYSICIANS	URBAN NUMBER	URBAN RATIO %	RURAL NUMBER	RURAL RATIO %
Barbados	140	113	11.4	27	1.9
Guyana	191	145	4.4	46	1.4
Jamaica	710	537	10.0	173	1.3
TOTAL	1041	795	/	246	

Source: PAHO Health Conditions in the Americas, op. cit.

Dentists

The production of dentists in Latin America as a whole and the Caribbean specifically has seen little progress during the past decade. Again Dominica, St. Vincent, and St. Lucia had lower dentist to population ratios than any country in the Western Hemisphere other than Haiti. In St. Lucia, for example, with only 2 dentists to serve the population the ratio per 10,000 is less than 0.2. Put in other terms, if both dentists worked six days a week and saw eight patients a day fifty-two weeks a year it would take almost five years to see every St. Lucian, if the population remained constant. This also assumes equal distribution geographically of dentists/population, and equal access and use by population.

Similar ratios exist throughout the Caribbean and the incidence and prevalence of dental caries is high. The effects of nutritional status and diet significantly affect the levels of dental disease but the positive benefits of dental prophylaxis and dental education are equally undeniable.

Nursing Personnel

In North America the ratio of nurses to total population was more than 10 per 1,000 population in 1972. In many countries of the Commonwealth Caribbean the ratio was from 20% to 50% of this

or 2 to 5 nurses per 1,000 population. Table II-A-1 breaks down the numbers and ratios of nursing personnel (graduate nurses and nursing auxilliaries) by country in the Commonwealth Caribbean.

A wide divergence in the numbers and ratios of both graduate nurses and nursing auxilliaries exists in the Caribbean. Unlike many of the other Latin American countries a high percentage of the nursing personnel are graduate nurses. In Montserrat, for example a ratio of 43.3 graduate nurses per 10,000 population was reported compared to a Latin American average of 2.9. High ratios were also reported in the Turks and Caicos (38.3), Trinidad and Tobago (28.0) and St. Kitts-Nevis-Anguilla (27.6). The lowest ratio was in Jamaica at 5.6 graduate nurses per 10,000 population (twice the Latin American average).

The number of nursing auxilliaries in much of the Commonwealth Caribbean is low relative to the numbers of graduate nurses (see Table II-A-1 and Table II-A-4). Task differentiation, levels of training, and recruitment mechanisms for nursing personnel have not been identified in the context of this paper as little information is available and what does exist differs substantially from island to island.

Auxiliary nursing personnel, however, generally supplement and complement the role of the graduate nurse. The role of graduate nurses in LDCs is usually of a technical, supervisory,

TABLE IV

Graduates of Dentistry, Veterinary Medicine and Nursing, with Ratios of Graduates per 10,000 Population, by Country

Country	Year	Dentistry		Veterinary Medicine		Nursing			
						Professional (a)		Auxiliary	
		Number	Ratio	Number	Ratio	Number	Ratio	Number	Ratio
Antigua	1972	-	-	-	-	8	1.1	6	0.8
Argentina	1971	611	0.3	140	0.1	208	0.1	1215	0.5
Barbados	1972	-	-	-	-	37	1.5	36	1.5
Bolivia	1970	97	0.2	34	0.1	b) 57	0.1	b) 105	0.2
Canada	1972	396	0.2	225	0.1	9657	4.4	4395	2.0
Cayman Islands	1972	-	-	-	-	-	-	11	10.0
Chile	1972	96	0.1	...	...	335	0.3	1800	1.8
Colombia	1970	77	0.0	...	...	81	0.0	c) 779	0.4
Dominican Republic	1969	3	0.0	9	0.0	b) 33	0.1	b) 78	0.2
Ecuador	1970	52	0.1	...	...	41	0.1	157	0.3
El Salvador	1970	57	0.2	-	-	b) 120	0.3	b) 221	0.6
Grenada	1972	-	-	-	-	12	1.2	14	1.5
Guatemala	1972	35	0.1	13	0.0	47	0.1	d) 271	0.5
Guyana	1970	-	-	-	-	63	0.9	...	...
Haiti	1972	10	0.0	-	-	60	0.1	48	0.1
Honduras	1970	5	0.0	-	-	...	...	144	0.6
Jamaica	1970	-	-	-	-	235	1.3	60	0.3
Mexico	1972	430	0.1	312	0.1	e) 969	0.2	...	...
Nicaragua	1969	9	0.0	8	0.0	d) 91	0.5	d) 158	0.8
Panama	1972	...	...	-	-	39	0.3	156	1.0
Paraguay	1969	27	0.1	27	0.1	50	0.2	20	0.1
Peru	1972	88	0.1	57	0.0	275	0.2	240	0.2
Puerto Rico	1971	32	0.1	-	-	536	1.9	577	2.1
St. Kitts-Nevis-Anguilla (f)	1972	-	-	-	-	8	1.7	-	-
Surinam	1972	-	-	-	-	37	0.7	64	1.3
Trinidad and Tobago	1972	-	-	-	-	269	2.6	143	1.4
United States	1971	3 743	0.2	b) 1 238	0.1	40 435	2.0	87 664	1.3
Uruguay	1970	71	0.2	56	0.2	b) 40	0.1	334	1.2
Venezuela	1972	315	0.3	173	0.2	703	0.6	390	0.4

Note: Only schools with data on graduates are included.
(a) Training of graduate nurses at universities and non-university centers. (b) 1972. (c) 1969. (d) 1970.
(e) Incomplete data. (f) Data for St. Kitts-Nevis.

SOURCE: Health Conditions in the Americas , Op cit P. 86

or educational mode. In the Commonwealth Caribbean the low ratio of auxiliary to graduate nurses suggests that tasks that might be done by a cadre of auxiliaries are being accomplished by graduate nurses raising the question of the cost-effectiveness of such a system.

One serious problem in the nursing supply situation is the high incidence of migration. In Jamaica, for example, figures for 1967 indicated a cadre of 4,865 graduate nurses in that country. After adjusting for migration in the 1971 figures only 1,066 nurses remained. Similarly nursing auxiliaries dropped from 958 in 1967 to 198 in 1971. The migration will be discussed later in this section of the study.

Due to the large number of graduate nurses and small number of physicians, the nurse to physician ratio is fairly high. While such a ratio might be considered desirable; if there were a larger number of physicians available for the areas the ratio would no longer be optimal. This is not to propose that more (M.D.) physicians are needed but rather that adequate training at all levels seems necessary to provide the proper cost and quality-effective ratios for providing health care.

Ancillary Personnel

Due to the complexity of modern medical science increasing numbers of skilled specialists are needed to provide effective

medical care. The need for laboratory technicians, x-ray technicians, pharmaceutical technicians, physical therapists, nutritionists, sanitary engineers and inspectors, health educators, administrators and statisticians is increasing. Data on the numbers and types of personnel in these categories is limited and is often available only on hospital-based personnel. The data reported to PAHO/WHO for 1970 is presented in Table II-A-5.

Migration

Two serious problems related to migration exist in the Commonwealth Caribbean. The first is the tremendous amount of inter-island and interregional migration of the population as a whole. The second is the so called "medical brain-drain" from the Caribbean to other Caribbean Countries or to the United States, Canada or Great Britain. (Documentation of both these problems is very limited).

What little documentation exists on the first of these problems is considered inaccurate and misleading. It would not be inaccurate, however, to state that the slowly declining growth rate is due to a great extent to migration as well as family planning activities.

A study published in Demography in August 1975 attempted to assess the impact of net migration loss on the fertility of

TABLE VI-A-5

Number of Other Health Personnel by Categories per 100,000 Population by Country, around 1970

Area	Pharmacists	Laboratory technicians	X-ray technicians	Nutritionists and dieticians	Physiotherapists	Sanitary engineers	Sanitary inspectors	Veterinarians	Othe
Antigua	21	4	1	1	-	-	15	2	
Argentina (b)	2625	2290	2193	491	...	66	363	3000	72
Bahamas	1	44	12	-	12	...	23	4	4
Barbados	83	32	7	2	4	1	84	5	
Belize	1	7	7	1	-	1	17	5	
Bolivia	1600	c, d) 35	9	24	...	1	74	250	2
Brazil	14026	2629	2382	828	...	...	...	2960	e) 19
Canada	11609	f) 11209	4626	1923	2942	...	...	g) 2600	e) 64
Chile	340	426	...	501	...	...	...	...	e) 39
Colombia	1200	h) 1363	...	...	...	180	1800	38	e) 43
Costa Rica	36	111	58	24	7	3	75	d) 38	4
Dominica (c)	1	5	3	...	...	1	8	1	
Dominican Republic	1075	236	c, i) 46	18	...	21	c, i) 272	150	2
Ecuador	46	186	...	c) 12	d) 18	...	161	...	e) 17
El Salvador	518	179	64	12	...	11	163	30	32
French Guiana	10	12	...	...	...	1	19	1	e)
Grenada	29	8	2	1	1	2	13	1	1
Guadeloupe	68	...	2	...	...	1	2	4	e) 1
Guatemala	201	96	48	11	...	43	147	115	e) 4
Guyana	6	41	5	1	5	1	93	1	
Haiti (h)	111	63	20	a) 4	5	5	41	...	2
Honduras	i) 7	138	54	4	4	3	95	2	e) 1
Jamaica	298	150	53	9	c, h) 9	4	351	30	9
Martinique	83	...	...	...	...	...	...	...	
Mexico	192	1280	1339	397	174	...	...	42	116
Montserrat	-	1	-	-	-	-	...	1	.
Nicaragua	430	153	45	6	...	17	181	68	e) 2
Panama	269	289	93	16	3	24	130	16	e)
Panama Canal Zone	11	49	18	8	4	-	7	7	e)
Paraguay	43	69	38	14	...	2	77	1	e) 30
Peru	2422	985	401	c) 214	55	220	210	900	e) 6
Puerto Rico	1135	684	356	389	513	17	640	20	127
St. Kitts, Nevis and Anguilla (j)	k) 13	2	2	1	-	-	16	1	
St. Lucia	11	11	2	3	2	1	18	1	
St. Vincent	13	2	1	...	...	-	9	1	
Surinam	15	l) 28	l) 30	5	9	-	36	6	12
Trinidad and Tobago	289	10	23	15	...	3	97	18	e) 6
United States	130750	79000	100000	30000	15000	35000	12100	28100	1 61.. 3
Venezuela	2749	716	153	374	36	308	137	888	e) 290
Virgin Islands (UK)	1	2	1	...	1	-	2	-	

(a) Available data summed for other categories reported, irrespective of year. (b) Hospital personnel. (c) In government service. (d) 1969. (e) Data not available for several categories. (f) Including technicians with responsibilities for both laboratory and X-ray. (g) Estimate. (h) 1970. (i) 1971. (j) Data for St. Kitts-Nevis. (k) Chemists and druggists with certificate to practice. (l) Provisional.

SOURCE: Health Conditions in the Americas , op cit, p.82

Barbados.[1] Emigration in that country's history has played a crucial role in reducing population size and growth. This is effective geometrically through emigration; i.e. an inhabitant leaves and in turn removes potential and actual fertility. The crude birth rate in Barbados was 33.6 in 1960 and 20.5 in 1970.

Despite inadequate data availability the conclusion of the study was "that up to 1958 the crude birth rate would have been lower than it was had there been no net migration loss. In the years 1959 and 1960 the actual crude birth rates were almost the same as those that would have resulted if there were no migration loss. During the period 1961-1970, the lack of emigration during the period 1951-1970 would have kept the birth rate somewhat higher than was actually realized. Migration loss is very instrumental in the fertility declines which have occurred in Barbados during the period 1960 to the present. However, other factors are perhaps equally or more important than migration loss and contraceptive use is more than likely the chief of these factors."[2]

Essentially then for the Caribbean as a whole it might be

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[1] Ebanks, G.E. et. al., "Emigration and Fertility Decline; The Case of Barbados", Demography 12:3; 431-45, August 1975.

[2] Ibid., p. 444.

concluded that both migration and family planning have significant effects on fertility declines and careful consideration of both factors must be made in family planning programming.

The medical brain drain is a matter of great concern in the context of this health sector study. This brain drain is not limited to physicians alone but includes nurses, nursing auxiliaries, and other levels of health professionals. The majority of these emigrants go to Canada and the United States. In one recent year the dean of medicine at UWI estimated that 40% of the medical graduates trained at UWI left for North America (most for Canada). In the past decade Canada itself has gained more physicians via immigration than by its own medical school graduates. The irony of the situation is that the borderline economies of the tiny nations such as Grenada, St. Lucia, St. Vincent and Dominica are subsidizing (through their support of the UWI medical school) the medical education of migrated Canadian physicians. While studies have not been done similar migration patterns are more than likely the case to both the U.S. and Great Britain.

The objective of having the University of the West Indies medical school become a first-rate teaching center has in the opinion of many observers backfired. They contend that training

TABLE VI

Number of Schools of Dentistry, Medicine, Nursing, Nursing-Midwifery, Public Health, Veterinary Medicine, and Nutrition and Dietetics in the Americas, 1972

Country	Dentistry	Medicine	Nursing	Nursing-midwifery	Public health	Veterinary medicine	Nutrition-Dietetics
tic a	-	-	1	1	-	-	-
ge una	8	9	50	8	1	5	2
hamas	-	-	1	-	-	-	-
rbados	-	-	2	1	-	-	-
liz	-	-	1	-	-	-	-
liv	4	3	5	2	-	1	-
zil	49	76	36	8	6	15	7
nada	10	16	179	...	1	3	22
ile	4	8	14	8	1	2	2
lo bia	5	9	11	2	1	5	4
sta Rica	1	1	1	1	-	-	-
ba	2	3	22	7	1	2	-
m ica	-	-	1	1	-	-	-
m .can Republic	2	3	2	-	-	2	-
ua r	3	6	5	3	-	5	-
dor	1	1	2	-	-	-	-
	-	-	1	1	-	-	-
.ala	1	1	2	-	-	1	1
va	-	-	4	3	-	-	-
iti	1	1	3	1	-	-	-
nd as	1	1	2	-	-	-	-
na a	-	1	2	2	1	-	-
xi o	13	26	90	18	1	8	-
ntserrat	-	-	1	1	-	-	-
aragua	1	1	4	-	-	1	-
na a	1	1	1	-	-	-	-
ra ay	1	1	2	1	-	1	-
ru	4	6	19	2	1	4	-
erto Rico	1	1	10	1	1	-	3
ts-Nevis and Anguilla	-	-	2	-	-	-	-
ia	-	-	1	1	-	-	-
Vincent	-	-	1	1	-	-	-
rinam	-	1	3	1	-	-	-
in. ad and Tobago	-	-	3	2	-	-	-
ite States	51	112	1338	8	17	18	87
uguay	1	1	2	1	-	1	1
nezuela	3	7	15	-	1	3	2
T al	166	296	1839	84	33	77	131

SOURCE: Health Conditions in the Americas, op cit, p. 83

physicians to a high degree of specialization makes it impractical to have them practice at home where the support services are inadequate and the work unchallenging. The UWI has come under fire for facilitating this drain process by promoting post-graduate training in comfortable surroundings such as the U.S. and Canada. There is increasing pressure from the contributors to UWI's medical school to increase training at a more practical level. Several ministries have suggested doing this on their own and pulling out of the UWI program.

Dr. Mohan Ragbeer, Dean of the University of the West Indies School of Medicine sees the problem in a different light. He feels that a primary cause of migration by the medical officers was the total lack of post graduate training at the medical school. Post-graduate programs are now being offered at UWI in Surgery, Internal Medicine, Pediatrics, Pathology, Microbiology, Public Health, Anesthesia, and Radiology. These programs operate in Kingston, Port of Spain General Hospital and Queen Elizabeth Hospital in Bridgetown, Barbados. Segments of the training are still conducted in certain teaching hospitals in the U.S., Canada, and the United Kingdom. More than 40 post-graduate students are involved in these programs each year. Early estimates indicate that ten will have to go abroad each year to complete their training. No figures on revised migration after

the implementation of the post-graduate training are available.

According to Dr. Ragbeer, the positive attitude of the students themselves substantiates his confidence in the future availability of post-graduate trained physicians. He feels that the more recent students have a totally different outlook from their colleagues of five years ago.

"It is the element of incentive that Jamaica and other Caribbean countries must refine, says Dr. Ragbeer. You don't ask a host country such as Canada to lock out these potential immigrants; you make them want to stay home. I believe any efforts to stem anything called a brain drain must be made from within. We have to develop a health care environment in which these young people want to live their lives."[4]

A similar situation exists in the migration of registered nurses in the Caribbean. While the data from a 1965 survey by the Jamaican nurses association is both dated and geographically focused several interesting points are made.[5] The survey that was undertaken explored the attitudes and preferences of a

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[4] Korcok, Milan, "Medical Brain Drain from the Caribbean Subsidized Canada," Canadian Medical Journal, May 4, 1974, Vol. 110, pp. 1089-1092.

[5] Seivwright, M. "Project Report on Factors Affecting Mass Mirgatio of Jamaican Nurses to the U.S." Jamaican Nurse, Vol. 5., December 1965, p. 8-13.

selected group of emigrated Jamaican nurses living in the U.S. Three overriding concerns were expressed by these nurses as being factors which induced them to emigrate. The first was intolerable or at least difficult working conditions in Jamaica, the second was unfair and unsatisfying administrative policies and relationships and the third was a lack of sufficient remuneration for services.

Table II-A-7 shows the results of a study of the movement and location of U.W.I. Medical Graduates from the Classes 1954-65. The input is defined as the total number of graduates orginating in a certain territory while output refers to the number of graduates located in a certain territory. These figures are somewhat dated but give an indication of the numbers of physicians emigrating and where.

Table II-A-8 shows more recent figures of migration into the United States from figures provided by the U.S. Bureau of Immigration and Naturalization. These figures do not represent total migration but indicate the numbers of professional health personnel coming into the U.S. the figures for Canada and the United Kingdom can be assumed to be comparable or greater. The U.S. figures have remained fairly stable for available years (1970-75).

Table II-A-7

Graduates, categorised according to country of origin and location

From \ To	Jamai	Trin	Barb	Guya	Small W.I.	Devel	Less devel	Un-known	Total Input (ABS)	Total Input (%)
Jamaica	98	2	1	0	2	28	1	4	136	44.4
Trinidad	9	18	1	0	0	6	0	4	38	12.4
Barbados	10	0	7	0	2	4	0	5	28	9.2
Guyana	15	1	1	18	2	18	0	1	56	18.3
Small W.I.	10	2	0	1	18	6	0	5	40	13.1
Developed	1	0	0	0	0	4	0	0	5	1.6
Less Developed	0	0	0	0	0	1	2	0	3	1.0
TOTAL OUTPUT (ABS)	143	23	10	19	22	67	3	19	306	
TOTAL OUTPUT (%)	46.7	7.5	3.3	6.2	7.2	21.9	1.0	6.2		100.0

[1]The data in the summary do not coincide with the lists.

[2]U.W.I.: A survey of Medical Graduates (July 1968). Prepared by Profs: E. H. Back and P. C. Feng.

[3]Four Jamaican graduates were deceased by the time the survey was made.

Small W.I. are the smaller islands that contribute to the U.W.I.:
Antigua, Belize, Dominica, Grenada, Montserrat, St. Kitts, St. Lucia, St. Vincent, and the Turks and Caicos

Developed are the following developed nations: Australia, Canada The United States, and the U.K.

Less Developed are the following less developed nations: Bermuda Curacao , Ghana, and Hong Kong

SOURCE: Bruinsma, John H. "A Study of the Movement and Location of U.W.I. Medical Graduates, Classes 1954-1965" West Indian Journal of Medicine Vol. 19, June 1970 p. 91-93

FISCAL YEAR 1973

IMMIGRANTS ADMITTED
COUNTRY OR REGION OF LAST PERMANENT RESIDENCE
BY P.T.K., STUDENTS AND ALL OTHER OCCUPATIONS

Table II-A-8

COUNTRY	TOTAL PHYSICIANS, SURGEONS AND DENTISTS	PHYSICIANS SURGEONS AND DENTISTS			NURSES				OTHER MEDICAL AND RELATED FIELDS										
		PHYSICIANS	SURGEONS	DENTISTS	TOTAL NURSES	PROFESSIONAL NURSES	STUDENT PROF NURSES	TOTAL OTHER MEDICAL AND RELATED FIELDS	CHIROPRACTORS	DIETITIANS	OPTOMETRISTS	OSTEOPATHS	PHARMACISTS	TECHNICIANS, MEDICAL & DENTAL	THERAPISTS	HEALERS &	VETERINARIANS
NORTH AMERICA	545	505		40	975	958	17	409	3	45	5	1	53	253	29		2
CANADA	291	274		17	536	529	7	150	2	19	1	1	18	78	22		
GREENLAND	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
MEXICO	55	52		3	26	26	-	25	-	1	1	-	5	15	-		
PUERTO RICO	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
ST. PIERRE & MIQUEL.	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
SAN ISLANDS	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
UNITED STATES	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
VIRGIN ISLANDS	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
WEST INDIES	155	141		14	346	336	10	211	1	25	3	-	29	139	6		
ANTIGUA	-	-		-	6	6	-	1	-	-	-	-	-	-	-		
BAHAMAS	6	6		-	7	7	-	1	-	-	-	-	-	1	-		
BARBADOS	-	-		-	31	31	-	7	-	-	-	-	-	6	1		
BELIZE	2	2		-	8	8	-	-	-	-	-	-	-	-	-		
BRIT. VIRGIN IS.	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
CAYMAN ISLANDS	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
CUBA	66	62		4	40	30	10	105	-	10	3	-	15	72	3		
DOMINICA	-	-		-	4	4	-	-	-	-	-	-	-	-	-		
DOMINICAN REPUBLIC	24	23		1	25	25	-	15	-	4	-	-	1	9	1		
GRENADA	-	-		-	11	11	-	2	-	-	-	-	-	2	-		
GUADELOUPE	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
HAITI	14	12		2	18	18	-	12	-	-	-	-	2	10	-		
JAMAICA	22	18		4	114	114	-	31	-	6	-	-	4	18	1		
MARTINIQUE	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
MONTSERRAT	1	1		-	-	-	-	1	-	1	-	-	-	-	-		
NETH. ANTILLES	1	-		1	2	2	-	-	-	-	-	-	-	-	-		
ST. CHRISTOPHER	-	-		-	3	3	-	-	-	-	-	-	-	-	-		
ST. LUCIA	-	-		-	1	1	-	-	-	-	-	-	-	-	-		
ST. VINCENT	2	2		-	11	11	-	2	-	-	-	-	1	1	-		
TRINIDAD & TOBAGO	12	10		2	65	65	-	34	1	4	-	-	6	20	-		
TURKS & CAICOS IS.	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
CENTRAL AMERICA	44	38		6	67	67	-	23	-	-	-	-	1	21	1		
BRITISH HONDURAS	-	-		-	7	7	-	3	-	-	-	-	-	3	-		
CANAL ZONE	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
COSTA RICA	3	2		1	5	5	-	3	-	-	-	-	-	3	-		
EL SALVADOR	11	8		3	13	13	-	3	-	-	-	-	-	3	-		
GUATEMALA	9	8		1	9	9	-	4	-	-	-	-	-	3	1		
HONDURAS	5	4		1	6	6	-	3	-	-	-	-	-	3	-		
NICARAGUA	3	3		-	11	11	-	1	-	-	-	-	-	1	-		
PANAMA	13	13		-	16	16	-	6	-	-	-	-	1	5	-		
SOUTH AMERICA	307	286		21	186	185	1	94	-	7	2	1	11	56	12		1
ARGENTINA	61	56		5	15	14	1	7	-	-	-	-	-	5	1		1
BOLIVIA	17	15		2	9	9	-	4	-	1	-	-	1	2	-		
BRAZIL	26	25		1	6	6	-	7	-	-	1	-	1	4	1		
CHILE	28	26		2	7	7	-	3	-	-	-	-	1	-	2		
COLOMBIA	78	75		3	17	17	-	25	-	3	-	-	1	18	3		
ECUADOR	13	11		2	14	14	-	8	-	-	-	-	2	3	2		1
FALKLAND ISLANDS	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
FRENCH GUIANA	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
GUYANA	5	4		1	89	89	-	24	-	3	-	-	1	17	2		
PARAGUAY	10	10		-	2	2	-	2	-	-	-	-	1	1	-		
PERU	52	48		4	16	16	-	7	-	-	1	-	2	2	1		1
[illegible]	-	-		-	-	-	-	-	-	-	-	-	-	-	-		
[illegible]	6	5		1	5	5	-	3	-	-	-	-	-	2	-		1
[illegible]	33	33		-	6	6	-	4	-	-	-	-	1	2	-		

B. Medical Facilities and Equipment

In the Commonwealth Caribbean health services are provided at a variety of out-patient and in-patient facilities. The out-patient facilities may be directly associated with a hospital or they may be sources of primary care in a rural setting. Table II-B-1 attempts to classify these establishments as either health centers and posts or clinics and dispensaries. The distinction between these types of health facilities is not always clear and easily recognizable but in general terms a health post and health center are free-standing out-patient facilities while clinics and dispensaries are usually considered to be related in some way to a hospital facility. All of these establishments usually serve as the center of health activities for both preventive and curative services. The types of specialized services provided vary with the size and staffing of the individual facility.

In-patient facilities deal almost exclusively with curative services. They may range in size from only a few beds to a large medical teaching center such as at the University of the West Indies. The size of hospital facilities (in beds) is often a key indicator to the depth and breadth of specialized services offered. These services are provided for the most part through government owned and financed institutions although private sector health care seems to be available in many of the more

Table II-B-1

Health Establishments with Outpatient Services,

by Country, 1972

AREA	TOTAL	HEALTH CENTERS & POSTS	CLINICS AND DIS-PENSARIES	OTHER
Antigua	18	3	15	-
Barbados	27	20	7	-
Belize	29	22	7	-
Cayman Islands	5	1	4	-
Dominica	42	3	39	-
Grenada	28	5	23	-
Guyana	96	51	45	-
Montserrat	13	12	1	-
St. Kitts-Nevis and Aguilla	21	16	5	-
St. Lucia	28	26	2	-
St. Vincent	28	-	28	-
Trinidad and Tobago	232	101	131	-
Turks and Caicos				

Islands	13	12	1	-
Virgin Islands	9	8	1	-

developed Caribbean polities.

Health Services

It is difficult to accurately measure by means of numbers of facilities only the actual extent of health services coverage. Populations in urban areas may have access to a number of health care providers while those residing in rural areas may have ready access to none. Numbers of centers, posts, or dispensaries are essentially meaningless unless some indication of the numbers and types of personnel operating out of these centers is identified. Since information on this subject is scarce and non-existent for the less developed Commonwealth Caribbean, other measures must be utilized to determine the extent of services coverage.

Figures are presented in the following tables for total outpatient visits and ratios per 100 population, health laboratories and examinations, dental clinics and services rendered, mental health and rehabilitation centers, and maternal and child health centers and services. While these figures do not present a comprehensive examination of health services coverage they do indicate the number of visits per 100 population and services available. Unfortunately much information from the less-developed countries is not reported and once again the reader is forced to extrapolate conclusions about those less developed countries from their more developed neighbors regarding coverage

of services.

Table II-B-2 indicates the number of persons attending health clinics (total persons and visits) and their ratios per 100 population. In the United States the average number of visits per person per year is slightly over 1. Comparably in Antigua for example the number of visits per person per year is close to one visit per person every four years. To contrast in the Turks and Caicos Islands 5.33 visits per person per year is recorded indicating an exceptionally high level of clinic visits. The mean number of visits for the less developed countries is almost 2 per person per year, while there were only approximately 3/4 of a visit per person per year in the more developed countries. This can lead to several conclusions. It may indicate that the records keeping process is unreliable, that health services (out-patient) are more readily available in the LDC's, that the population in the LDC's is sicker and needs more outpatient visits, that the effective demand is greater for outpatient services because in-patient services are not available, or that some other form of health care substitution/self referral mechanisms are taking place in the more developed countries. From the limited data it would be difficult to accurately ascertain the causal relationship between the number of visits and the relative state of social and

Table II-B-2

Number of Persons Attending Health Establishments, Total Visits, and Ratios per 100 Population, by Country, 1972

AREA	Persons		Visits	
	Number	Ratio	Number	Ratio
Antigua	12,000	16.0	22,000	24.3
Barbados	21,114	8.8	212,524	88.6
Cayman Islands	...	...	34,000	309.1
Grenada	...	...	87,803	91.5
Montserrat	...	...	14,979	115.2
St. Kitts-Nevis and Anguilla	11,639	17.9	52,263	80.4
Trinidad and Tobago	160,165	15.4	781,688	74.9
Turks and Caicos Islands	...	...	32,000	533.3
Virgin Islands	...	...	8,078	67.1

economic development in the West Indies. One might accurately suspect, however, that a combination of factors rather than a single cause is at the root of these statistics.

Table II-B-3 shows the number of health laboratories and procedures for 1968 and 1972 for 9 of the Commonwealth Caribbean polities. As with health clinics the numbers of facilities and procedures (visits) give only a limited indication of the technological or qualitative competence of the various institutions. Public health laboratories may include a diverse group of institutions with similarly various technological and resource capabilities. The existence of facilities, however, and the capability to achieve greater technological competence is an important indicator of the expected course of health care delivery system progress.

Similarly the number of dental health clinics, mental health clinics and rehabilitation centers are shown in Table II-B-4. As can be seen all these indicators of "depth" of the health service system demonstrate a relatively low level of comprehensive health care delivery facilities. Prority for existing funding appears to be concentrated on general medicine outpatient facilities with concommitant lack of resource expenditure on other forms of health care.

The Ten Year Health Plan for the Americas, and the

Table II-B-3

Dental Health Clinics and Services around 1968 and 1972

and

Number of Mental Health Clinics and Rehabilitation Centers

around 1968 and 1972

AREA	1968 Number of Clinics	1968 Persons Treated	1972 Number of clinics	1972 Persons Treated	Mental Health clinics 1968	Mental Health clinics 1972	Rehabilitati Centers 1968	Rehabilitati Centers 1972
Antigua	...	...	3	5,007	...	1	...	-
Barbados	...	...	20	20,753	1	2	...	1
Belize	1	6,363	1	...	1	1	-	-
Cayman Islands	...	...	1	4,142	-	-	-	-
Dominica	2	...	1	...	1	1	-	-

Grenada	...	...	7	...	...	6	...	-
Guyana	...	...	7	...	3	2	2	2
Jamaica	75	191,000	...	168,674	15	...	1	...
Montserrat	...	...	1	4,124	-	-	-	-
St. Kitts, Nevis and Anguilla	1	2,462	4	3,495	1	3	-	-
St. Lucia	4	6,911	5	10,355	1	-	1	-
St. Vincent	...	...	1	...	...	2	...	...
Trinidad and Tobago	18	67,613	76	71,610	5	9	4	1
Turks and Caicos Islands	...	...	1	...	-	-	-	-
Virgin Islands	1	...	1	1,891	-	2	-	-

Table II-B-4

Number of Public Health Laboratories and Examinations, around 1968 and 1972

AREA	1968		1972	
	Laboratories	Examinations	Laboratories	Examinations
Barbados	...	...	2	110,597
Belize	1	42,205	1	...
Grenada	...	...	1	12,752
Guyana	...	249,398	8	224,094
Jamaica	...	595,249	19	920,000
St. Kitts-Nevis and Anguilla	1	30,569	1	26,025
St. Lucia	1	6,387	1	...
Trinidad and Tobago	11	809,998	12	...

Virgin Islands	...	...	1	9,810

Conference of Ministers Responsible for Health have placed high priority on health care services for mother and child. Tables II-B-5 and II-B-6 show the number of maternal health services and child health services for reporting countries of the West Indies. Once again, the number of centers is essentially meaningless unless placed in a geographic and quality of care context. The key figures in Table II-B-5 are the number of women receiving services per 100 live births and the percent of deliveries done in hospitals. These figures can give an indication of the availability of services and the numbers of women able and willing to participate. Most developed nations have close to 100% of their births delivered at hospitals. The figures range from approximately 1 in 4 births taking place in hospitals in Grenada to almost 100% in Barbados.[1].

Overall in comparison to much of Latin America fairly abundant maternal services appear to be available and utilized in the West Indies. Again however, quality of services and their accessibility to the rural and underserved population is not addressed in the given data.

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[1] The Cayman Islands report 126.4% of their births taking place in hospitals. Whether this indicates a high rate of grand multiparit or unreliable statistical information is unclear although the latt seems more likely.

Table II-B-5

MATERNAL HEALTH CENTERS AND SERVICES, BY COUNTRY, 1972

Area	Year	Centers	Pregnant women receiving services			Deliveries in hospitals	
			Number	Per 100 live births	Home visits	Number	Per 100 live births
Antigua	1972	10	511	32.5	98	1252	79.6
Argentina	1971	198	...	...	...	...	...
Barbados	1972	11	4683	88.3	...	5151	97.1
Bolivia	1972	120	45845	53.8	...	12090	14.2
Brazil	1970	a) 759	b) 604596	...	84756	...	...
Canada	1972	451	...	...	...	...	...
Cayman Islands	1972	1	351	128.8	-	345	126.4
Chile	1972	7	...	...	...	...	...
Colombia	1972	25	137081	20.0	36773	...	...
Costa Rica	1972	...	...	...	...	44913	84.3
Cuba	1970	20	...	...	...	...	...
Dominican Republic	1972	84	77327	47.8	4150	78830	48.7
Ecuador	1969	44	27117	12.3	...	...	...
El Salvador	1972	...	43811	28.8	550	42713	27.9
Falkland Islands	1972	1	39	100.0	-	39	100.0
Grenada	1972	36	939	28.5	...	839	28.5
Guatemala	1972	78	45039	20.5	...	35251	15.3
Guyana	1972	103	...	...	...	...	...
Haiti	1970	1	...	...	...	...	...
Honduras	1970	74	...	...	...	...	...
Mexico (c)	1971	102	28868	...	...	19990	...
Panama	1972	13	28498	51.9	4143	32545	59.3
Paraguay	1972	247	56397	70.8	-	6395	8.0
Peru	1971	391	123452	26.5	11924	87481	18.7
Puerto Rico	1968	76	61974	89.9	8920	65330	94.8
St. Kitts-Nevis-Anguilla	1972	16	862	69.7	736	929	75.1
St. Lucia	1972	28	3697	36.6	...	...	...
Trinidad and Tobago	1972	118	25740	98.2	2405	15721	60.0
Turks and Caicos Islands	1972	4	200	105.3	...	120	63.2
Uruguay	1972	26	9432	14.3	1114	20143	30.5
Venezuela	1972	644	69629	18.9	37440	253481	61.4
Virgin Islands (UK)	1972	3	...	...	...	272	89.5

(a) Prenatal centers other than hospital outpatient clinics. (b) Pregnant women attending 431 public health establishments. ( ) Incomplete data.

Table II-B-6

CHILD HEALTH CENTERS AND SERVICES, BY COUNTRY, AROUND 1972

Area	Child Health						
	Centers	Infants (under 1 year)			Children 1-5 years		
		Attended		Visited in home	Attended		Visited in home
		Number	Per 100 live births		Number	Per infant attended	
Antigua	17	1330	84.6	201	288	0.2	214
Argentina	198	...	...	...	...	...	...
Barbados	10	1372	25.9	..	3669	2.7	...
Bolivia	103	49831	58.4	...	63014	1.3	...
Brazil	b) 1087	1796357	...	c) 160626	d) 2818010	...	e) 99633
Canada	911	...	...	...	...	...	...
Colombia	18	158732	23.2	16039	e) 250414	1.6	e) 15450
Cuba	30	...	...	...	...	...	...
Dominican Republic	84	90803	56.1	25870	195352	2.2	-
Ecuador	44	23960	10.9	...	27688	1.2	...
El Salvador	...	100833	65.9	11908	e) 210227	2.1	e) 15700
Falkland Islands	1	39	100.0	-	...	...	-
Grenada	36	...	...	...	f) 1734	...	...
Guatemala	393	52279	23.5	...	59931	1.1	...
Guyana	103	...	...	1476	g) 10835	...	j) 6845
Haiti	1	...	...	...	...	...	...
Honduras	74	...	...	...	...	...	...
Mexico (i)	28	135324	...	...	194263	1.1	..
Panama	12	8183	14.9	...	[illegible]	0.6	i) [illegible]
Paraguay	247	42724	53.7	1036	[illegible]	1.4	-
Peru	391	243119	52.1	[illegible]	[illegible]	1.1	[illegible]
St. Kitts-Nevis-Anguilla	19	...	...	2319	i) [illegible]	..	[illegible]
[illegible]	28	3338	77.8	...	[illegible]	[illegible]	...
Trinidad and Tobago	119	10611	10.5	[illegible]	[illegible]	[illegible]	[illegible]
Turks and Caicos Islands	4	100	62.8	...	...	...	...
Uruguay	26	21484	32.0	5[illegible]	[illegible]	[illegible]	[illegible]
Venezuela	644	...	...	a) 115[illegible]	[illegible]	...	[illegible]

(a) Children 0-2 years. (b) Centers for children under [illegible] years of age. (c) Number of visits. (d) Children 1-14 years. (e) Children 1-4 years. (f) Children 0-4 years. (g) Children 1-2 years. (h) Children [illegible] years. (i) Incomplete data.

Regarding child health services very limited data is available as can be seen from Table II-B-6. In comparing this data, however, with infant morbidity and mortality figures in Appendix A one can conclude that there is a great deal of room for improvement in both nutrition and health services to infants and small children.

The Ten-Year Health Plan for the Americas recommended an objective attainment of 60% coverage for pre-natal care. Of the 8 reporting countries 75% have achieved this goal. The goal of 60-90% of all deliveries taking place in hospitals has been achieved by 86% of the reporting countries. Goals for child health services coverage are 90 per cent for children under 1 year of age and 50-70% of those 1-4 years of age. In the Caribbean none of the first objectives have been yet achieved.

Hospital Facilities

Many factors determine hospital utilization among which are health problems of the population, accessibility, quality of care, cost, and availability of appropriate facilities. Unutilized hospital facilities are extremely expensive to maintain. Therefore the need for accurate and adequate statistics is essential for cost efficient operation, improving patient care and planning for the health services of the population at the regional and national level. As can be seen in

the following tables this data is often times deficient in both quality and quantity. Further, standarized procedures for data collection, dissemination, and analysis are usually not followed.

Hospital bed ratios for the American region were 7.5 per 1,000 population for North America and 3.1 beds per 1,000 population for Latin America. In the Caribbean the bed per 1,000 population ratio is 5.9 for the more developed countries and 5.8 for the less developed.[2] For short stay hospitals the mean is 4.0 beds per 1,000 population for the more developed countries and 4.2 beds per 1,000 for the less developed countries. Thus in terms of numbers of beds, there is not a great difference between the less developed and more developed countries. Figures indicating accessibility to care and quality of care within these different settings are not available. Table II-B-7 shows the number of hospital beds by type of hospital with ratios per 1,000 population. In most of the countries very limited facilities are available in specialty hospitals dealing with MCH services, TB, psychiatric disorders, or leprosy. It is interesting to note again the wide disparity in health care services from island to

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[2] Less developed countries are classified as: Antigua, Belize, Cayman Islands, Dominica, Grenada, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent, Turks and Caicos, and the British Virgin Islands. More developed countries include: Barbados, Jamaica, Guyana, and Trinidad and Tobago.

Table II-8-7

NUMBER OF HOSPITAL BEDS BY TYPE OF HOSPITAL WITH RATIOS PER 1,000 POPULATION, BY COUNTRY

Area	Year	All hospitals (a)		General hospitals						Other hospitals				
		Number	Ratio	Total (a) Number	Ratio	General	Maternity	Pediatrics	Other (b)	Total (a)	Tuberculosis	Mental diseases	Leprosy	Other
Antigua	1972	428	5.9	220	3.0	220	-	-	-	208	-	160	48	-
Argentina	1971	133 847	5.7	103 380	4.4	96 908	3 300	2947	225	30 467	5434	20 847	1 600	2 586
Bahamas	1972	996	5.2	586	3.1	586	-	-	-	410	-	200	10	200
Barbados	1972	2 216	9.2	1 518	6.3	1 483	35	-	-	698	-	690	8	-
Belize	1972	641	5.0	392	3.1	392	-	-	-	249	52	139	-	58
Bermuda	1968	552	11.0	236	4.7	236	-	-	-	316	-	240	-	76
Bolivia	1970	9 674	2.0	8 601	1.7	8 107	242	219	33	1 073	508	452	85	28
Brazil	1971	367 522	3.8	212 594	2.2	147 949	34 738	29 909	-	154 928	23 940	80 176	17 051	33 761
Canada	1971	211 109	9.8	125 706	5.8	122 547	133	2 740	286	85 403	2 860	57 049	-	25 494
Cayman Islands	1968	34	3.8	34	3.8	34	-	-	-	-	-	-	-	-
Chile	1970	35 773	3.7	29 049	3.0	27 040	97	1 441	471	6 724	1 140	4 631	-	953
Colombia	1972	44 762	2.0	35 524	1.6	33 167	681	1 656	40	9 238	1 745	6 800	284	629
Costa Rica	1972	7 184	3.9	5 246	2.8	4 620	136	490	-	1 918	419	1 410	89	-
Cuba	1972	37 101	4.2	28 201	3.2	18 423	4 852	4772	154	8 900	1 529	5 687	581	1 103
Dominica	1971	289	4.0	264	3.7	264	-	-	-	25	21	-	4	-
Dominican Republic	1972	11 975	2.8	10 163	2.4	9 117	378	648	20	1 812	480	700	132	500
Ecuador	1971	13 357	2.1	10 284	1.6	8 482	865	666	271	3 073	1 171	1 608	210	86
El Salvador	1971	7 312	2.1	5 572	1.6	4 928	307	337	-	1 740	905	728	-	107
Falkland Islands	1968	32	16.0	32	16.0	32	-	-	-	-	-	-	-	-
French Guiana	1965	641	15.6	521	12.7	521	-	-	-	120	-	-	120	-
Grenada	1971	650	6.8	306	3.2	306	-	-	-	344	40	180	-	124
Guadeloupe	1971	3 586	10.7	2 786	8.4	2 786	-	-	-	780	50	550	180	-
Guatemala	1971	12 732	2.4	9 818	1.8	...	...	...	...	2 914	...	...	...	...
Guyana	1971	3 364	4.8	2 314	3.1	2 314	-	-	-	1 050	246	450	354	-
Haiti	1972	3 494	0.7	2 908	0.6	2 691	117	-	-	686	410	198	-	78
Honduras	1972	4 508	1.7	3 831	1.4	3 405	426	-	-	677	472	205	-	-
Jamaica	1971	7 565	4.0	4 048	2.1	3 672	176	200	-	3 537	237	3 115	195	-
Martinique	1968	3 741	11.5	3 185	9.8	3 076	109	-	-	556	196	360	-	-
Mexico	1971	62 586	1.2	53 190	1.0	47 650	2 794	2 748	-	9 376	1 311	5 507	40	2 518
Montserrat	1969	87	5.8	87	5.8	87	-	-	-	-	-	-	-	-
Netherlands Antilles	1968	1 969	9.2	1 259	5.9	...	...	...	...	710	210	500	-	-
Nicaragua	1972	5 017	2.5	3 937	2.0	3 937	-	-	-	1 080	487	523	90	-
Panama	1972	4 844	3.2	3 989	2.8	3 741	-	248	-	955	-	855	-	-
Panama Canal Z.	1972	683	15.2	400	8.9	400	-	-	-	283	-	235	48	-
Paraguay	1972	3 799	1.5	2 727	1.1	2 537	110	-	30	1 072	368	504	124	78
Peru	1972	29 086	2.0	26 849	1.9	25 471	644	722	12	2 237	112	1 881	8	456
Puerto Rico	1972	12 146	4.3	9 944	3.2	9 875	-	45	24	3 202	985	1 709	39	489
St.Kitts-Nevis and Anguilla	1972	364	5.6	238	3.7	238	-	-	-	126	-	-	-	126
St. Lucia	1972	512	4.5	390	3.4	390	-	-	-	122	-	110	-	12
St.Pierre and Miquelon	1968	95	19.0	70	14.0	70	-	-	-	25	25	-	-	-
St. Vincent	1972	529	5.8	264	2.9	264	-	-	-	265	50	70	20	125
Surinam	1972	1 910	4.8	1 260	3.0	1 260	-	-	-	650	100	550	-	-
Trinidad and Tobago	1970	5 839	5.7	2 933	2.9	...	...	...	...	2 908	...	...	...	...
Turks and Caicos Islands	1964	32	5.3	32	5.3	29	4	-	-	-	-	-	-	-
United States	1972	1 507 988	7.2	1 008 187	4.8	1 004 799	1 852	-	1 536	499 801	17 806	418 457	504	33 004
Uruguay (c)	1971	16 603	5.7	10 460	3.6	...	...	...	...	6 143	...	...	...	...
Venezuela	1972	32 893	3.0	23 444	2.1	21 305	1 150	989	-	9 449	2 503	5 185	630	1 131
Virgin Islands (UK)	1970	43	4.3	43	4.3	43	-	-	-	-	-	-	-	-
Virgin Islands (US)	1970	248	4.0	248	4.0	248	-	-	-	-	-	-	-	-
Northern America		1 719 744	7.5	1 134 199	4.9	1 127 852	1 985	2 740	1 822	585 545	20 691	475 776	504	88 574
Middle America		199 311	2.1	154 932	1.7	121 904	9 334	9 486	198	44 379	7 834	23 631	1 474	5 420
South America		693 283	3.6	467 039	2.4	375 143	41 905	33 543	1 082	226 224	37 265	122 642	20 418	29 758

(a) Includes beds for which type of hospital not reported. (b) Includes beds in hospitals for infectious diseases, eye, ear, nose and throat diseases and for emergency care. (c) Distribution by type estimated.

island. Barbados has the highest ratio of general hospital beds per 1,000 population in the western hemisphere. St. Vincent and Trinidad on the other hand have not half that many.

Figures on geographical distribution of hospital beds are only available for Barbados, Belize, Grenada and Guyana. While it would be inaccurate to generalize from this small sample Table II-B-8 indicates for these four countries the inequitable distribution for urban and rural hospital facilities. In Grenada for example twenty times more beds are found in the capital city than in the remainder of the country as a whole. This may well represent a trend towards centralization of regional tertiary care facilities but in reality often indicates a two-tier level of care provided for urban and rural residents.

Hospitals for the most part in the Commonwealth Caribbean are owned by the government either through the Ministry of Health or the Social Security Ministries. Table II-B-9 shows the hospital ownership patterns. As can be seen, flourishing private sector hospital care is available in the more developed countries. An average of 38% of the hospitals and 10% of the beds are privately owned in the more developed countries. In the less developed countries one would expect more publicly owned hospitals. Ownership figures for these countries are not available.

Table II-B-8

NUMBER OF HOSPITALS BY TYPE IN THE AMERICAS, BY COUNTRY

Country	Year	Total	General hospitals					Other hospitals				
			Total	General	Maternity	Pediatrics	Other (a)	Total	Tuberculosis	Mental diseases	Leprosy	Other
Antigua	1972	3	1	1	-	-	-	2	-	1	1	-
Argentina	1971	2864	2743	2486	218	31	10	121	31	57	7	26
Bahamas	1972	10	7	7	-	-	-	3	-	1	1	1
Barbados	1972	13	11	9	2	-	-	2	-	1	1	-
Belize	1972	13	10	10	-	-	-	3	1	1	-	1
Bermuda	1968	4	1	1	-	-	-	3	-	1	-	2
Bolivia	1970	269	256	244	6	5	1	13	8	3	1	1
Brazil	1971	4067	3463	3144	195	124	-	604	109	281	34	190
Canada	1971	1407	921	909	3	8	1	486	23	122	-	341
Cayman Islands	1966	1	1	1	-	-	-	-	-	-	-	-
Chile	1970	280	269	244	5	6	4	21	5	5	-	11
Colombia	1972	747	697	653	25	18	1	50	12	28	3	7
Costa Rica	1972	45	40	38	1	1	-	5	2	2	1	-
Cuba	1972	241	214	143	50	20	1	27	6	12	2	7
Dominica	1971	6	4	4	-	-	-	2	1	-	1	-
Dominican Republic	1972	308	300	286	5	7	2	8	2	1	1	2
Ecuador	1971	214	190	143	32	6	9	24	10	9	2	3
El Salvador	1971	76	68	64	3	1	-	8	4	2	-	2
Falkland Islands	1968	1	1	1	-	-	-	-	-	-	-	-
French Guiana	1965	4	3	3	-	-	-	1	-	-	1	-
Grenada	1971	7	4	4	-	-	-	3	1	1	-	1
Guadeloupe	1971	26	23	23	-	-	-	3	1	1	1	-
Guatemala (b)	1971	101	91	...	...	...	...	10	...	...	...	...
Guyana	1971	41	38	38	-	-	-	3	1	1	1	-
Haiti	1972	48	41	39	2	-	-	7	3	2	-	2
Honduras	1972	37	35	34	1	-	-	2	1	1	-	-
Jamaica	1971	67	64	62	1	1	-	3	1	1	1	-
Martinique	1968	15	13	9	4	-	-	2	1	1	-	-
Mexico	1971	1521	1478	1348	102	28	-	43	10	20	1	12
Montserrat	1969	2	2	2	-	-	-	-	-	-	-	-
Netherlands Antilles (b)	1968	8	6	...	...	...	...	2	1	1	-	-
Nicaragua	1972	55	51	51	-	-	-	4	2	1	1	-
Panama	1972	50	49	48	-	1	-	1	-	1	-	-
Panama Canal Zone	1972	4	2	2	-	-	-	2	-	1	1	-
Paraguay	1972	133	128	124	1	-	1	7	2	1	2	2
Peru	1972	435	421	408	10	1	2	14	3	6	1	4
Puerto Rico	1972	132	121	119	-	1	1	11	4	3	1	3
St. Kitts-Nevis and Anguilla	1972	5	3	3	-	-	-	2	-	-	-	2
St. Lucia	1972	6	4	4	-	-	-	2	-	1	-	1
St. Pierre and Miquelon	1966	2	1	1	-	-	-	1	1	-	-	-
St. Vincent	1972	5	4	4	-	-	-	1	1	1	1	1
Surinam	1972	16	14	14	-	-	-	2	1	1	-	-
Trinidad and Tobago (b)	1970	28	24	...	...	...	...	4	...	...	...	...
Turks and Caicos Islands	1964	4	4	4	-	-	-	-	-	-	-	-
United States of America	1972	7678	6681	6607	47	-	27	997	99	533	3	362
Uruguay (c)	1971	149	141	...	...	...	...	8	...	...	...	...
Venezuela	1972	340	284	262	14	8	-	56	13	23	2	18
Virgin Islands (UK)	1970	1	1	1	-	-	-	-	-	-	-	-
Virgin Islands (US)	1966	3	3	3	-	-	-	-	-	-	-	-
Northern America		9091	7804	7518	50	8	28	1487	123	656	3	705
Middle America (c)		2342	2679	2303	171	60	4	183	42	57	15	35
South America (e)		9560	8636	7754	504	199	26	924	195	415	54	252

(a) Includes hospitals for infectious disease, eye, ear, nose and throat diseases and for emergency care.
(b) Includes hospitals for which type not reported. (c) Distribution as general or other estimated. (d) Distribution by type not specified for 121 general and 14 other hospitals. (e) Distribution by type not specified for 141 general and 8 other hospitals.

Table II-B-9

Hospital Beds with Rat .s per 1,000 Population in Capitals and Large Cities and the Remainder of 21 Countries Around 1972

Area	Year	Total		Capitals and large cities		Remainder of country	
		Number	Ratio	Number	Ratio	Number	Ratio
Bahamas(a)	1972	961	5.1	929	8.2	32	0.4
Barbados(b)	1972	2216	9.2	1725	17.6	491	3.5
Belize(c)	1971	608	4.9	447	9.0	161	2.2
Brazil(d)	1971	367522	3.8	146469	7.1	221053	3.0
Canada(e)	1971	211109	9.8	82114	15.3	128995	9.0
Colombia(a)	1971	46179	2.1	8341	3.2	37838	2.0
Costa Rica(a)	1972	7358	4.0	4230	19.4	3126	1.9
Dominican Republic(f)	1972	11975	2.8	6931	5.2	5044	1.7
El Salvador(a)	1972	6398	1.7	3074	8.9	3324	1.0
Grenada(b)	1971	628	6.5	548	23.0	80	1.1
Guatemala(c)	1972	8004	1.5	5637	4.3	2367	0.8
Guyana (c)	1972	2392	3.2	1591	3.5	801	2.7
Haiti(a)	1972	2600	0.5	1456	4.7	1144	0.2
Honduras(e)	1972	4508	1.7	3237	9.3	1271	0.5
Mexico(a)	1971	47297	0.9	22363	2.4	24934	0.6
Nicaragua(a)	1972	5017	2.5	2186	5.4	2831	1.3
Panama(a)	1972	5665	3.7	2872	7.7	2793	2.4
Peru(g)	1972	29086	2.0	14023	4.8	15063	1.3
Puerto Rico(e)	1971	12370	4.5	7247	6.4	5123	3.1
Surinam(c)	1971	2012	5.0	1687	12.3	325	1.2
Venezuela(a)	1972	32993	3.0	9877	4.0	23116	2.7

(a) Capital city. (b) Parish, including capital city. (c) District or department. (d) Capitals of states (e) Capital and cities with more than 100,000 population. (f) Zone comprising National District and provinces of Peravia and San Cristobal.
(g) Lima and Callao.

Hospital size (beds) is often an accurate indicator of the extent of specialized services available in that institution. Large teaching hospitals offer the greatest variety and complexity of services while small dispensary types of hospitals offer only general medical and surgical capability. After a certain size, however, economies of scale begin to take effect making a 250-350 bed hospital more efficient to operate than a larger 500 bed facility. Quality of care also can often be inversely proportional to the size of a facility. Table II-B-10 shows the number and percentage distribution of short stay hospitals and beds by hospital size by area for 6 reporting countries of the region.

No single pattern is apparent in either the number of hospitals or beds available in the region. It is important to remember that some of the larger facilities in the more developed countries such as Queen Elizabeth Hospital in Barbados, and teaching facilities in Guyana and Jamaica serve as tertiary care referral centers and their service area (area from which patients are drawn) extends beyond their national borders to the Commonwealth Caribbean as a whole. Regionalization of services and lack of service duplication promotes cost efficiency in facility operation. Cost efficiency can best be maintained by hospitals in the 200-400 bed range. Too many services and too

Table II-B-10

DISTRIBUTION OF HOSPITALS AND BEDS BY OWNERSHIP, BY COUNTRY, AROUND 1972

Area	Year	Hospitals								
		Total	Ministry of health		Social security		Other public		Private	
			Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Argentina	1971	2 664	124	4.3	87	3.0	1 083	37.8	1 570	54.8
Bahamas	1972	10	9	90.0	-	-	-	-	1	10.0
Barbados	1972	13	10	76.9	-	-	-	-	3	23.1
Bolivia	1970	269	110	40.9	35	13.0	47	17.5	77	28.6
Brazil	1971	4 067	a) 142	3.5	-	-	518	12.7	3 407	83.8
Canada	1971	1 407	94	6.7	-	-	1 176	83.6	137	9.7
Chile	1970	280	228	81.4	-	-	31	11.1	21	7.5
Colombia	1972	747	551	73.8	40	5.4	-	-	156	20.9
Costa Rica	1972	45	34	75.6	5	11.1	-	-	6	13.3
Cuba	1972	241	241	100.0	-	-	-	-	-	-
Dominican Republic	1972	306	80	26.1	13	4.2	15	4.9	198	64.7
Ecuador	1971	214	6	2.8	12	5.6	87	40.7	109	50.9
El Salvador	1971	76	24	31.6	19	25.0	2	2.6	31	40.8
Guatemala	1971	101	44	43.6	43	42.6	3	3.0	11	10.9
Guyana	1971	41	29	70.7	-	-	-	-	12	29.3
Haiti	1972	48	28	58.3	2	4.2	-	-	18	37.5
Honduras	1972	37	15	40.5	1	2.7	-	-	21	56.8
Jamaica	1971	67	26	38.8	-	-	1	1.5	40	59.7
Mexico	1971	1 521	653	12.9	333	21.9	77	5.1	458	30.1
Nicaragua	1972	55	-	-	5	9.1	23	41.8	27	49.1
Panama	1972	50	36	72.0	2	4.0	-	-	12	24.0
Paraguay	1972	133	84	63.2	21	15.8	27	20.3	1	0.8
Peru	1972	435	177	40.7	20	4.6	64	14.7	174	40.0
Trinidad and Tobago	1970	28	17	60.7	-	-	-	-	11	39.3
United States	1972	7 678	15	0.2	-	-	2 795	36.4	4 868	63.4
Uruguay	1971	149	...	...	...	...	...	...	...	...
Venezuela	1972	340	95	27.9	18	5.3	69	20.3	158	46.5
		Beds								
Argentina	1971	133 847	29 310	21.9	4 977	3.7	69 485	51.9	30 095	22.5
Bahamas	1972	996	961	96.5	-	-	-	-	35	3.6
Barbados	1972	2 216	2 104	94.9	-	-	-	-	112	5.1
Bolivia	1970	9 674	4 462	46.1	1 546	16.0	2 293	23.7	1 373	14.2
Brazil	1971	367 522	a) 23 496	6.4	-	-	101 105	27.5	242 921	66.1
Canada	1970	211 109	7 959	3.7	-	-	197 255	93.4	5 995	2.8
Chile	1970	35 773	33 444	93.5	-	-	1 573	4.4	756	2.1
Colombia	1972	44 762	33 360	74.5	5 259	11.8	-	-	6 133	13.7
Costa Rica	1972	7 164	5 500	76.8	1 362	19.0	-	-	302	4.2
Cuba	1972	37 101	37 101	100.0	-	-	-	-	-	-
Dominican Republic	1972	11 975	6 495	54.2	2 008	16.8	582	4.9	2 892	24.2
Ecuador	1971	3 357	308	2.3	966	7.2	10 140	75.9	1 943	14.5
El Salvador	1971	7 312	5 871	80.3	611	8.4	220	3.0	610	8.3
Guatemala	1971	12 732	9 470	74.4	2 188	17.2	375	2.9	699	5.5
Guyana	1971	3 364	2 778	82.6	-	-	-	-	586	17.4
Haiti	1972	3 494	2 528	72.3	78	2.2	-	-	890	25.5
Honduras	1972	4 508	3 254	72.2	275	6.1	-	-	979	21.7
Jamaica	1971	7 585	6 488	85.5	-	-	482	6.4	615	8.1
Mexico	1971	82 565	18 402	29.4	30 068	48.1	5 276	8.4	8 820	14.1
Nicaragua	1972	5 017	-	-	617	12.3	3 816	76.1	584	11.6
Panama	1972	4 844	3 670	79.9	524	10.8	-	-	450	9.3
Paraguay	1972	3 799	2 433	64.0	774	20.4	567	14.9	25	0.7
Peru	1972	29 088	13 318	45.9	3 840	13.2	6 992	24.0	4 938	17.0
Trinidad and Tobago	1970	5 839	4 986	85.4	-	-	-	-	853	14.6
United States	1972	1 507 988	7 892	0.5	-	-	775 053	51.4	725 043	48.1
Uruguay	1971	16 603	...	...	...	...	...	...	...	...
Venezuela	1972	32 893	19 122	58.1	2 776	8.4	5 977	18.2	5 018	15.3

a) Federal government.

much equipment is necessary to operate a hospital under 200 beds or over 400 beds. Twenty-four of 119 hospitals (reported) in the Commonwealth Caribbean are in the 100-499 bed range, eighty are under 50 beds, fourteen between 50-99 beds and 2 are over 500 beds. Oftentimes combinations of small hospitals through shared services and facilities can promote cost and quality efficiency.

Rising costs of construction and operation necessitate the best possible utilization of existing hospital facilities. Key measures of utilization in hospitals are occupancy rates, turnover, patient days, and length of stay. Table II-8-11 indicates these indices of utilization. The single most important measures of utilization is the percentage occupancy rate. An occupancy rate (average) of 80-85% is considered efficient. This means that on only 3-5 days of the year will patients have to be turned away due to capacity utilization.[3] Too high an occupancy rate means that overcrowding or rejection of patients is occuring with some regularity and quality is suffering. Too low an occupancy rate on the other hand indicates a lack of efficiency. Estimates in the United States show that it costs between $50-100,000 per year to maintain one unused bed.[4] This is certainly much higher than a similar figure for the

[3] Using a Poison Distribution.

Table II-B-11

NUMBER AND PERCENTAGE DISTRIBUTION OF SHORT STAY HOSPITALS AND BEDS BY HOSPITAL SIZE, BY COUNTRY, AROUND 1972

Area	Total	Hospitals							
		Under 50 beds		50-99 beds		100-499 beds		500 and more beds	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Total	8440	3061	36.3	1957	23.2	3068	36.4	354	4.2
United States	6857	2196	32.0	1679	24.5	2682	39.1	300	4.4
Latin America	1568	864	55.1	275	17.5	378	24.1	51	3.3
Antigua	1	-	-	-	-	1	100.0	-	-
Bahamas	7	5	71.4	1	14.3	1	14.3	-	-
Barbados	6	4	66.7	1	16.7	-	-	1	16.7
Belize	9	7	77.8	1	11.1	1	11.1	-	-
Chile (a)	234	109	46.6	50	22.6	64	27.4	11	4.7
Costa Rica	40	20	50.0	5	12.5	13	32.5	2	5.0
Cuba	213	103	48.4	29	13.6	73	34.3	8	3.8
Ecuador (b)	98	50	51.0	21	21.4	26	26.5	1	1.0
El Salvador (c)	66	44	66.7	8	12.1	12	18.2	2	3.0
Guatemala	91	47	51.6	18	19.8	24	26.4	2	2.2
Guyana	38	30	78.9	3	7.9	4	10.5	1	2.6
Honduras	35	19	54.3	6	17.1	9	25.7	1	2.9
Jamaica	64	39	60.9	9	14.1	16	25.0	-	-
Nicaragua	51	29	56.9	11	21.6	10	19.6	1	2.0
Panama (d)	35	22	62.9	7	20.0	5	14.3	1	2.9
Panama Canal Zone	2	-	-	-	-	2	100.0	-	-
Paraguay (b)	99	93	93.9	3	3.0	2	2.0	1	1.0
Peru	194	105	54.1	29	14.9	51	26.3	9	4.6
Puerto Rico	118	68	57.6	26	22.0	22	18.6	2	1.7
St. Vincent	1	-	-	-	-	1	100.0	-	-
Surinam	14	7	50.0	3	21.4	4	28.6	-	-
Venezuela (b)	152	63	41.4	44	28.9	37	24.3	8	5.3
				Beds					
Total	1157015	83917	7.3	138063	11.9	675506	58.4	259529	22.4
United States	1000269	66890	6.7	119298	11.9	594673	59.5	219408	21.9
Latin America	156746	17027	10.9	18765	12.0	80833	51.6	40121	25.6
Antigua	220	-	-	-	-	220	100.0	-	-
Bahamas	586	61	10.4	75	12.8	450	76.8	-	-
Barbados	692	57	8.2	90	13.0	-	-	545	78.8
Belize	378	161	42.6	55	14.6	162	42.9	-	-
Chile (a)	27479	2337	8.5	3448	12.5	13598	49.5	8096	29.5
Costa Rica	5258	417	7.9	341	6.5	2786	53.0	1714	32.6
Cuba	28047	2383	8.5	2098	7.5	17260	61.5	6306	22.5
Ecuador (b)	9022	1390	15.3	1432	15.8	5188	57.5	1022	11.3
El Salvador (c)	5572	695	12.5	542	9.7	2743	49.2	1592	28.6
Guatemala	9818	731	7.4	1310	13.3	5561	56.6	2216	22.6
Guyana	2314	534	23.1	185	8.0	604	26.1	991	42.8
Honduras	3831	454	11.9	376	9.8	2255	58.9	746	19.5
Jamaica	4048	511	12.6	633	15.6	2904	71.7	-	-
Nicaragua	3937	440	11.2	749	19.0	1890	48.0	858	21.8
Panama (d)	3015	342	11.3	546	18.1	1308	43.4	819	27.2
Panama Canal Zone	400	-	-	-	-	400	100.0	-	-
Paraguay (b)	2160	905	41.9	132	6.1	514	23.8	609	28.2
Peru	21159	2189	10.3	1957	9.2	9732	46.0	7281	34.4
Puerto Rico	8875	1614	18.2	1862	21.0	4223	47.6	1176	13.3
St. Vincent	211	-	-	-	-	211	100.0	-	-
Surinam	1260	170	13.5	189	15.0	901	71.5	-	-
Venezuela (b)	18464	1648	8.9	2745	14.9	7923	42.9	6150	33.3

(a) Excludes beds in 25 hospitals of the public sector. (b) Excludes private sector. (c) Excludes beds in two hospitals of private sector. (d) Ministry of Health hospitals only.

Caribbean but points out the waste of already insufficient resources through low occupancy and utilization. Occupancy rates of less than 60% in Dominica and 70% in St. Kitts and St. Vincent point to wasted resources.

Length of stay (average days) is another useful measure of hospital utilization. Unlike occupancy rates, however, length of stay varies considerably with the type of hospital, patient diagnosis, and the type of medical care provided. Large numbers of obstetrical beds where an average length of stay would be 3-4 days would give a very different length of stay from an orthopedic facility where length of stay maybe 1-2 months. Too long a length of stay indicates inefficiency in bed turnover (see turnover rates) while too short a length of stay may indicate too few facilities and patients being discharged to make room for more severely ill patients. A length of stay between 7-9 days is considered average. The countries of the Caribbean range from 5-6 days in Dominica to 15.3 days in St. Kitts-Nevis.

It is important to consider that utilization of facilities is highly dependent on a number of factors that have been mentioned above. Proper utilization of facilities is dependent on sufficient and relevant data and statistics on the use of available resources. With the high percentage of health

[4] American Hospital Association estimates.

resources expended in the hospital sector it is important to assure the most efficient utilization of staff and facilities.

Table II-B-12

Indices of Utilization of Short-Stay Hospitals in the Americas

Area	Year	Beds	Discharges	Patient days	Turn-over rate	Average days of stay	Occupancy rate (Per cent)
Anticua (a)	1972	220	3 907	...	17.8	...	...
Bahamas (b)	1972	450	14 372	162 504	31.9	11.3	98.7
Barbados (a)	1972	560	19 044	179 658	32.8	9.4	84.6
Belize (a)	1972	378	11 993	...	31.7	...	...
Canada	1971	426 734	3 561 566	36 707 191	28.1	10.3	79.4
Costa Rica	1972	5 258	208 941	1 467 531	39.7	7.0	78.3
Cuba (a)	1972	28047	1 031 573	7 730 912	38.6	7.2	75.8
Dominica (b) (c)	1971	162	9 219	25 203	33.0	5.6	59.5
Dominican Republic (d)	1972	9 393	367 129	2 629 999	38.7	7.2	71.9
Ecuador (e)	1971	10 115	252 848	2 261 714	25.0	9.9	61.3
El Salvador	1971	5 572	214 507	1 489 021	38.5	6.9	72.2
Guyana (b)	1971	991	29 427	300 155	29.7	10.2	83.0
Honduras (f)	1972	2 952	67 606	701 125	23.6	10.3	67.2
Nicaragua	1972	3 353	93 591	882 143	27.9	9.4	71.9
Panama (f)	1972	3 539	107 300	851 718	30.3	7.9	65.8
Panama Canal Zone	1972	400	11 619	90 154	29.0	7.8	61.6
Paraguay	1972	2 464	59 771	487 044	24.3	8.1	54.0
Peru	1972	21 159	464 752	5 596 532	22.0	12.0	72.3
Puerto Rico	1972	8 875	323 912	2 356 592	36.5	7.3	72.5
St. Kitts, Nevis (a)	1972	239	4 127	63 105	17.3	15.3	72.4
St. Lucia	1972	233	7 454	...	32.0	...	...
St. Vincent (a)	1972	211	5 907	52 607	28.0	8.9	68.1
Surinam	1971	1 482	27 620	386 192	18.6	14.0	71.4
United States	1972	1 000 269	32 793 191	277 312 313	32.8	8.5	75.8
Venezuela (a)	1972	10 287	390 759	3 218 683	38.0	8.2	85.4

(a) Ministry of Health hospitals only. (b) One government hospital. (c) General hospitals excluding beds for long-stay patients. (d) Excludes data for eight private hospitals with 150 beds (e) Excludes data for 17 institutions without information on discharges. (f) Public sector hospitals, only.

Establishments in the health sector by type, dependency and number of beds

Year a)

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*:
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL	40	2,997	4	26	19	511	5	296	12	2,164	-	-	180
with doctor	40	2,997	4	26	19	511	5	296	12	2,164	-	-	
without doctor	-	-	-	-	-	-	-	-	-	-	-	-	180
Public subsector TOTAL	36	2,858	3	21	17	477	5	296	11	2,064			178
with doctor	36	2,858	3	21	17	477	5	296	11	2,064			
without doctor	-	-	-	-	-	-	-	-	-	-			178
Ministry of Pub. Health													
with doctor													
without doctor													
Social Security													
with doctor													
without doctor													
Other agencies													
with doctor													
without doctor													
Private subsector TOTAL	4	139	1	5	2	34			1	100			2
with doctor	4	139	1	5	2	34			1	100			-
without doctor	-	-	-	-	-	-			-	-			2
Profit-making agencies	3	115	1	5	1	10			1	100			
with doctor	3	115	1	5	1	10			1	100			
without doctor	-	-	-	-	-	-			-	-			
Non-profit-making agencies													
with doctor	1	24			1	24							-
without doctor	-	-			-	-							2

TABLE II-B-13 (EASTERN CARIBBEAN)

a) Including medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

b) Information is latest available: year 1968, 1969 or 1970. See individual tables that follow.

ANTIGUA

Establishments in the health sector by type, dependency and number of beds

Year 1969

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL	3	450			1	40			2	410			18
with doctor	3	450			1	40			2	410			18
without doctor													
Public subsector TOTAL													
with doctor	3	450			1	40			2	410			18
without doctor													
Ministry of Pub.Health													
with doctor	3	450			1	40			2	410			18
without doctor													
Social Security													
with doctor													
without doctor													
Other agencies													
with doctor													
without doctor													
Private subsector TOTAL													
with doctor													
without doctor													
Profit-making agencies													
with doctor													
without doctor													
Non-profit-making agencies													
with doctor													
without doctor													

Including medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

(continued)

P081 Establishments in the health sector by type, dependency and number of beds

Year 1969

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10**		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL	2	46	1	8	1	38							5
with doctor	2	46	1	8	1	38							5
without doctor													
Public subsector TOTAL	2	46	1	8	1	38							5
with doctor	2	46	1	8	1	38							5
without doctor													
Ministry of Pub.Health													
with doctor	2	46	1	8	1	38							5
without doctor													
Social Security													
with doctor			-	-	-	-							
without doctor													
Other agencies			-	-	-	-							
with doctor													
without doctor													
Private subsector TOTAL			-	-	-	-							
with doctor													
without doctor													
Profit-making agencies			-	-	-	-							
with doctor													
without doctor													
Non-profit-making agencies													
with doctor			-	-	-	-							
without doctor													

* Including medical care centers, such as health centers, health posts, dispensaries, clinics, etc. (continued)

Source: Report on existing Health Services - Ministry of Overseas Development.

** Infirmary

Annex - BVIs

Peeble's Hospital

Current bed Allocation

	Beds	
Male wards	8	
Female wards	8	
Obstetrics wards	7	
Children's wards	9	
Isolation ward	4	(3 used as store rooms)
Private rooms	2	
Total	38	

Old People's Unit

Male	4
Female	4
Total	8

080 Establishments in the health sector by type, dependency and number of beds Year 1976

Sector, subsectors and agencies	Establishments by number of beds												Number of establishments without beds*
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL	5	340	2	13	1	42	1	44	1	241			44
with doctor	5	340	2	13	1	42	1	44	1	241			
without doctor													
Public subsector TOTAL									1	241			
with doctor	5	340	2	13	1	42	1	44	1	**241			27
without doctor													
Ministry of Pub.Health													
with doctor													
without doctor													
Social Security													
with doctor													
without doctor													
Other agencies													
with doctor													
without doctor													
Private subsector TOTAL													
with doctor													
without doctor													
Profit-making agencies													
with doctor													
without doctor													
Non-profit-making agencies													
with doctor													
without doctor													

*Including medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

Source: Ministry of Education and Health

** Includes 40 Bed Tuberculosis Unit.

GRENADA

Establishments in the health sector by type, dependency and number of beds — Year 1968

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL	9	723	1	5	5	161	0		3	557	0		32
with doctor	9	723	1	5	5	161	0		3	557	0		0
without doctor	0		0		0		0		0		0		32
Public subsector TOTAL	6	684	0		3	127	0		3	557	0		30
with doctor	6	684	0		3	127	0		3	557	0		0
without doctor					0		0		0		0		30
Ministry of Pub.Health													
with doctor	6	684	0		3	127	0		3	557	0		0
without doctor	0		0		0		0		0		0		30
Social Security													
with doctor	0		0		0		0		0		0		0
without doctor	0		0		0		0		0		0		
Other agencies													
with doctor	0		0		0		0		0		0		0
without doctor	0		0		0		0		0		0		0
Private subsector TOTAL	3	39	1	5	2	34	0		0		0		2
with doctor	3	39	1	5	2	34	0		0		0		0
without doctor	0		0		0		0		0		0		2
Profit-making agencies													
with doctor	2	15	1	5	1	10	0		0		0		0
without doctor	0		0		0		0		0		0		0
Non-profit-making agencies													
with doctor	1	24	0		1	24	0		0		0		0
without doctor	0		0		0		0		0		0		2

*Including medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

Source: Ministry of Health, Housing and Local Government (based on Questionnaire for the fourth report on the World Health Situation, 1965-1968.)

Grenada (Con't)

Comments: Some figures are inconsistent with other tabulations, but there are no apparent major inaccuracies.

The 30 Ministry establishments without beds consist of 25 Medical Stations and 5 Health Centers. They are listed as "without physician" because by definition "with physician" implies presence every day. The 30 establishments are served by 10 district medical officers, available for scheduled sessions plus emergency calls.

MONTSERRAT

1081 Establishments in the health sector by type, dependency and number of beds — Year 1969

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL	2	87			1	29	1	58					10
with doctor	2	87			1	29	1	58					
without doctor													
Public subsector TOTAL													
with doctor	2	87			1	29	1	58					10
without doctor													
Ministry of Pub.Health													
with doctor	2	87			1	29	1	58					10
without doctor													
Social Security													
with doctor													
without doctor													
Other agencies													
with doctor													
without doctor													
Private subsector TOTAL													
with doctor													
without doctor													
Profit-making agencies													
with doctor													
without doctor													
Non-profit-making agencies													
with doctor													
without doctor													

*cluding medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

1083

ST. KITTS

Estab. ments in the health sector by type, dependency and number of beds

Year 1969

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
HEALTH SECTOR TOTAL													
with doctor	7	403			4	85	1	54	2	264			
without doctor													18
Public subsector TOTAL													
with doctor	7	403			4	85	1	54	2	264			
without doctor													18
Ministry of Pub. Health													
with doctor	7	403			4	85	1	54	2	264			
without doctor													18
Social Security													
with doctor													
without doctor													
Other agencies													
with doctor													
without doctor													
Private subsector TOTAL													
with doctor													
without doctor													
Profit-making agencies													
with doctor													
without doctor													
Non-profit-making agencies													
with doctor													
without doctor													

*Including medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

Source: National Health Planning Data - St. Kitts, Nevis and Anguilla.

ST. LUCIA

108k Establi ents in the health sector by type, dependency and number of beds — Year 1969

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10 *		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
ALTH SECTOR TOTAL													26
ith doctor	5	518	-	-	2	44	-	-	3	474	-	-	
ithout doctor													
blic subsector TOTAL													26
ith doctor	4	418	-	-	2	44	-	-	2	374	-	-	
ithout doctor													
nistry of Pub.Health													
ith doctor													
ithout doctor													
ial Security													
ith doctor													
ithout doctor													
ier agencies													
th doctor													
thout doctor													
vate subsector TOTAL													
th doctor	1	100							1	100			
thout doctor													
fit-making agencies													
th doctor													
thout doctor													
-profit-making													
ncies													
th doctor													
thout doctor													

uding medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

naternity beds at Vieux Fort Health Center not included here.

ST. VINCENT

1081 Establishments in the health sector by type, dependency and number of beds

Year 1970

Sector, subsectors and agencies	Establishments by number of beds												
	Total		Under 10		10 to 49		50 to 99		100 to 499		500 or more		Number of establishments without beds*
	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	No.	No. Beds	
EALTH SECTOR TOTAL	7	430			4	72	2	140	1	218			27
with doctor	7	430			4	72	2	140	1	218			
without doctor													
ublic subsector TOTAL													
with doctor	7	430			4	72	2	140	1	218			27
without doctor													
inistry of Pub.Health													
with doctor	7	430			4	72	2	140	1	218			27
without doctor													
ocial Security													
with doctor													
without doctor													
her agencies													
ith doctor													
ithout doctor													
ivate subsector TOTAL	—												
ith doctor													
ithout doctor													
ofit-making agencies													
ith doctor													
ithout doctor													
n-profit-making encies													
ith doctor													
ithout doctor													

cluding medical care centers, such as health centers, health posts, dispensaries, clinics, etc.

urce: Ministry of Education and Health

C. Environmental Health

Water Supply and Sewerage Disposal

Little substanative data has been gathered on the environmental sanitation situation in the Eastern Caribbean since the studies of March and October of 1966 completed for PAHO. Engineer Ribeiro of PAHO (Chief Engineer for the Caribbean Region) states, however, that little progress has been made in improving that situation since 1966. The following pages summarize for Grenada, St. Vincent, Barbados, St. Lucia, Dominica, Montserrat, Antigua, and St. Kitts-Nevis-Anguilla the status of water supply in those islands.

For the region as a whole, several general characteristics can be identified. Diarrhea, dysentery, and enteritis are of high incidence and prevalence in the English-speaking Caribbean. This is especially the case with infants and young children. Generally the quality of the water available on the islands is good, accessibility, however, is often inadequate and this may well account for the high levels of intestinal diseases seen in children. Increased supply through improved distribution could add a great deal to the environmental health levels.

The sources of water are enhanced by the numerous small springs and streams caused by the abundant rainfall and thick vegetation. Water is obtained on most of the islands from small

impoundments either on the springs or streams and distributed by gravity flow to the standpipes and house connections. Only on Antigua and Barbados is pumping water from ground sources necessary. Treatment of all these water sources is either non-existent or consists only of chlorination. St. Lucia and Grenada utilize a number of settling basins followed by slow sand filters.

The amount of coverage of the population with water supply systems is a high percentage, 68.5% on average (see Table II-C-2).[1] The majority of the population however get their water from public standpipes rather than by house connections. This decreases the amounts of water utilized and thus the environmental health of the population. The systems in existence are old (often 50 - 60 years) and resultant leaks, impeded flow, and corrosion not only reduce carrying capacity but promote wastage water loss as well.

In general the water works organizations are a part of the Department of Public Works. These organizations were still in the formative stages when the 1966 survey was done and improvement in this area has occurred due to increased government attention to these problems. There is still, however, a shortage

[1] Water supply and sewerage facilities for the entire region are compared in Table II-C-1.

Table II-C-1

NUMBER AND PERCENT OF POPULATION SERVED BY PIPED WATER SUPPLY SYSTEMS IN LATIN AMERICA, 1973 (POPULATION IN THOUSANDS)

Area	Urban Population						Rural Population				
	Total Population	Total Served		With house connections		With easy access	Total Population	Total Served		With house connections	With easy access
		Number	Per cent	Number	Per cent			Number	Per cent	Number	
Argentina	18770	14700	78	13700	73	1000	5950	1180	20	980	200
Barbados	110	110	100	107	97	3	131	130	99	41	89
Belize	69	52	75	33	48	19	58	5	9	3	2
Bolivia	1800	1347	75	862	48	485	3500	186	5	104	82
Brazil	60618	46676	77	32128	53	14548	42523	12000	30	10300	2600
Chile	7260	6800	94	5000	69	1800	3310	270	8	150	120
Colombia	14300	12700	89	11700	82	1000	8700	3000	34	2200	800
Costa Rica	654	654	100	621	95	33	1269	837	66	723	114
Cuba	5394	4587	85	4587	85	-	3522	160	5	150	-
Dominican Republic	2088	1665	80	1215	58	450	2312	441	19	236	205
Ecuador	2752	1794	65	1794	65	-	4068	379	9	379	-
El Salvador	1511	1287	85	780	52	507	2322	803	35	140	663
Guatemala	1973	1712	87	798	40	914	3692	81	2	70	11
Guyana	235	217	92	200	85	17	533	376	71	176	200
Haiti	908	411	45	165	18	246	3625	85	2	4	81
Honduras	848	826	97	547	65	279	1917	229	12	134	95
Jamaica	528	516	98	507	96	9	1426	1194	84	321	873
Mexico	34300	24660	73	23160	68	1700	21260	7590	36	7590	-
Nicaragua	943	943	100	494	52	449	1105	123	11	77	46
Panama	785	785	100	718	91	67	811	417	51	78	339
Paraguay	904	327	36	192	21	135	1512	93	6	2	91
Peru	7400	5400	73	4100	55	1300	6800	710	10	190	520
Surinam	208	208	100	152	74	54	197	69	35	17	52
Trinidad and Tobago	358	356	99	297	83	59	702	666	95	265	401
Uruguay	2432	2333	96	2100	86	233	575	180	31	95	85
Venezuela	8700	7650	88	6320	73	1330	4160	1754	42	1754	-
Eastern Caribbean	168	129	77	74	44	55	336	234	70	57	177
TOTAL	176014	139063	79	112371	64	26692	126316	34092	27	26246	7846

NUMBER AND PERCENT OF POPULATION SERVED BY SEWERAGE SYSTEMS IN LATIN AMERICA, 1973 (POPULATION IN THOUSANDS)

Area	Urban population		Per cent served	Rural Population	
	Total	Served		Total	Served
Argentina	18770	6700	36	5950	-
Barbados	110	-	-	131	-
Belize	69	3	4	58	-
Bolivia	1800	420	23	3500	122
Brazil	60618	17600	29	42523	1400
Chile	7260	2900	40	3310	150
Colombia	14300	9200	64	8700	3000
Costa Rica	654	262	40	1269	-
Cuba	5394	2170	40	3522	107
Dominican Republic	2088	407	19	2312	-
Ecuador	2752	1602	58	4068	32
El Salvador	1511	564	37	2322	11
Guatemala	1973	11	1	3692	-
Guyana	235	9	4	533	-
Haiti	908	-	-	3625	-
Honduras	848	386	46	1917	1
Jamaica (a)	520	139	27	1406	7
Mexico	34300	16460	48	21260	70
Nicaragua	943	212	22	1105	-
Panama	785	554	71	811	-
Paraguay	904	145	16	1512	-
Peru	7400	4100	55	6800	1
Surinam	208	85	41	197	-
Trinidad and Tobago	358	181	51	702	
Uruguay	2432	1 [illegible]	61		
Venezuela	8700	[illegible]	47	4160	[illegible]
Eastern Caribbean	168	[illegible]	[illegible]		-
Total	176 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(a) Data for 1972.

WATER SUPPLY

Year 1969/1970

COUNTRY	TOTAL (1,000)						URBAN (1,000)						RURAL (1,000)					
	POPULATION (1,000)	H.C.	%	H.C. or E.A.	Total	%	POPULATION (1,000)	H.C.	%	H.C. or E.A.	Total	%	POPULATION (1,000)	H.C.	%	H.C. or E.A.	Total	%
ANTIGUA	65.0	15.0	23.1	-	15.0	23.1	35.0	10.0	28.5	-	10.0	28.5	30.0	5.0	6.6	-	5.0	16.6
B. V. I.	10.5	0.8	7.6	8.0	8.8	83.5	2.5	0.2	8.0	0.7	0.9	36.0	8.0	0.6	7.5	7.3	7.9	98.0
DOMINICA	72.0	13.7	19.2	36.4	50.1	50.6	15.0	6.1	40.0	8.5	14.6	97.0	57.0	7.6	13.3	27.9	35.5	62.3
GRENADA	100.0	24.0	24.0	55.7	79.7	79.7	28.0	9.2	33.0	14.7	23.9	85.6	72.0	14.8	20.5	41.0	55.8	77.5
MONTSERRAT	12.8	5.8	45.0	6.6	12.4	97.0	2.7	2.6	96.0	0.1	2.7	100.0	10.1	3.2	32.0	6.5	9.7	96.0
ST. KITTS	45.1	12.1	27.0	33.0	45.1	100.0	13.0	5.7	44.0	7.3	13.0	100.0	32.1	6.4	20.0	25.7	32.1	100.0
ST. LUCIA	121.0	27.5	22.7	40.9	68.4	56.5	30.0	17.5	58.3	12.5	30.0	100.0	91.0	10.0	11.0	28.4	38.4	42.2
ST. VINCENT	89.1	23.4	26.3	36.0	59.4	62.6	17.3	10.1	58.5	6.2	16.3	93.5	71.8	13.3	18.5	29.8	43.1	60.0
TOTAL	515.5	122.3	23.8	216.6	338.9	65.8	143.5	61.4	42.8	50.0	111.4	77.0	372.0	60.9	16.4	166.6	227.5	61.0

Source: Windward Islands, Water authorities
Others, Ministries of Communications and Works; Public Health Inspectors

Comments: H. C = house connection. E. A. = easy access, which considered to be within 1/4 mile of a stand pipe

of capable and trained manpower to handle basic data collection and analysis; to plan, design, operate and maintain water supply systems, as well as carrying out capital improvements. Charges more in line with the costs of providing services are being assessed by the improved Water Works organizations although further improvements along these lines is still needed especially to develop growth reserves for further capital development and expansion. For the most part users of public standpipes are not assessed directly nor is metering a commonplace function. Island by island recommendations and conclusions are summarized in the following pages and are examined in more detail in "Report on the Water Supplies of the Windward-Leeward Islands; British West Indies; March 1966."

Sewerage disposal data is very limited for the Eastern Caribbean and the Commonwealth Caribbean. Table II-C-3 shows the Liquid Domestic Waste Disposal for Urban and Rural Populations as of 1970 for the Eastern Caribbean. Only Grenada, Dominica, Montserrat, St. Lucia and St. Vincent show figures for sewerage disposal. Of this group only Grenada, Dominica, and St. Lucia have house connections to public sewerage (8.0%, 10.4% and 4% respectively). The remainder either utilize latrines or septic tanks. Only Dominica has developed public sewerage facilities in rural areas. These conditions no doubt add to the gastro-

LIQUID DOMESTIC WASTE DISPOSAL

Year 1969/1970

TABLE II-C-3

COUNTRY	TOTAL (1,000) POPULATION	TOTAL (1,000) H.C. P.S.	%	OS	Total	%	URBAN (1,000) POPULATION	URBAN (1,000) H.C. P.S.	%	OS	Total	%	RURAL (1,000) POPULATION	RURAL (1,000) H.C. P.S.	%	OS	Total	%
ANTIGUA	65.0	NS	0.0	NA	-	-	35.0	NS	0.0	NA	-	-	30.0	NS	0.0	NA	-	-
B. V. I.	10.5	NS	0.0	NA	-	-	2.5	NS	0.0	NA	-	-	8.0	NS	0.0	NA	-	-
DOMINICA	72.0	7.5	10.4	21.8	29.3	40.7	15.0	4.3	28.7	1.6	5.9	39.3	57.0	3.2	5.6	20.2	23.4	41.0
GRENADA	100.0	8.0	8.0	NA	-	-	28.0	8.0	28.6	NA	-	-	72.0	NS	0.0	NA	-	-
MONTSERRAT	12.8	NS	0.0	7.1	7.1	55.5	2.7	NS	0.0	1.8	1.8	66.8	10.1	NS	0.0	5.3	5.3	52.5
ST. KITTS	45.1	NS	0.0	NA	-	-	13.0	NS	0.0	NA	-	-	32.1	NS	0.0	NA	-	-
ST. LUCIA	121.0	4.8	4.0	67.7	72.5	60.0	30.0	4.8	16.0	25.2	30.0	100.0	91.0	NS	0.0	42.5	42.5	46.7
ST. VINCENT	89.1	NS	0.0	73.4	73.4	82.3	17.3	NS	0.0	16.3	16.3	94.3	71.8	NS	0.0	57.1	57.1	79.5

NOTE: Information too scattered to provide any average figures.

LEGEND:
- HCPS House connection to public sewerage
- OS Other systems including septic tanks, latrines, etc.
- NA Information not available or with great discrepancies and not useable
- NS No public sewerage

Source: Public Health Inspectors

intestinal and communicable disease problems that abound in the region.

With regard to environmental pollution Table II-C-4 indicates the sources and degrees of environmental pollution occuring in the Eastern Caribbean. The majority of the pollution appears to be as a result of inadequate disposal of liquid waste that is often sent untreated into the ocean or street drains. Domestic and industrial pollution is present but does not appear to be as serious a threat to the environment as improper waste disposal. No legislation or regulations for the control of water pollution exists in the region. Programs being undertaken to combat this pollution is minimal.

Projections on estimates of total capital needs for the area were formulated in the 1966 reports showing totals for training, laboratory facilities, administrative support, and construction funds. By far the greatest amount of these funds are for the capital investment in construction funds. Changing costs for both labor and material will push these totals significantly higher. In 1966 figures the total capital needs were projected at $68.5 million (EC) or $34.25 ($US - 1966).

Phasing in of capital investment over a ten-year period (from 1966) shows an average yearly investmewnt of approximately $7.0 million dollars. It is not clear from the figures "how

much" environmental health this $7 million per year will buy or for whom, but the implication seems to be that this extension of coverage will be for house connections in each area or at least greatly expanded coverage from present status.

The following pages give island by island summaries of the water supply and environmental sanitation situations in the Eastern Caribbean.

ESTIMATE OF TOTAL CAPITAL NEEDS (W. I. DOLLARS)

	Training	Lab. Facilities	Metering	Field & Office Equip.	Constr. Equip.	Programme Survey	Constr. Funds	Totals
Gronada	10,000	10,000	250,000	16,000	150,000	-	9,000,000	9,436,000
St. Vincent	15,000	10,000	200,000	16,000	150,000	50,000	7,000,000	7,441,000
Barbados	-	-	500,000	-	-	-	23,000,000	23,500,000
St. Lucia	10,000	10,000	250,000	16,000	100,000	-	6,000,000	6,386,000
Dominica	15,000	10,000	200,000	16,000	100,000	-	7,000,000	7,341,000
Montserrat	8,000	10,000	50,000	10,000	50,000	40,000	2,500,000	2,668,000
Antigua	15,000	10,000	250,000	16,000	100,000	100,000	7,000,000	7,491,000
St. Kitts	10,000	10,000	-	16,000	80,000	50,000	4,000,000	4,166,000
Totals	83,000	70,000	1,700,000	106,000	730,000	240,000	65,500,000	68,429,000

$1.00 U.S. Dollar = Eastern Caribbean $2.00

TABLE II-C-6

PHASING

W.I. DOLLARS

Year	Grenada	St.Vincent	Barbados	St.Lucia	Dominica	Montserrat	Antigua	St.Kitts	Totals
0	-	50,000	-	-	-	-	100,000	50,000	200,000
1	696,000	984,000	2,400,000	906,000	786,000	384,000	1,391,000	533,000	8,080,000
2	990,000	857,000	2,400,000	830,000	555,000	384,000	1,000,000	583,000	7,599,000
3	1,050,000	1,000,000	2,400,000	850,000	550,000	300,000	1,000,000	500,000	7,650,000
4	1,500,000	1,050,000	2,400,000	800,000	600,000	400,000	1,000,000	500,000	8,250,000
5	1,900,000	1,000,000	2,400,000	800,000	700,000	300,000	1,000,000	500,000	8,600,000
6	1,500,000	900,000	2,300,000	800,000	1,000,000	300,000	1,000,000	500,000	8,300,000
7	600,000	800,000	2,300,000	700,000	900,000	300,000	1,000,000	500,000	7,100,000
8	500,000	800,000	2,300,000	700,000	800,000	300,000	-	500,000	5,900,000
9	400,000	-	2,300,000	-	800,000	-	-	-	3,500,000
10	300,000	-	2,300,000	-	700,000	-	-	-	3,300,000
Totals	9,436,000	7,441,000	23,500,000	6,386,000	7,391,000	2,668,000	7,491,000	4,166,000	68,479,000

much" environmental health this $7 million per year will buy or for whom, but the implication seems to be that this extension of coverage will be for house connections in each area or at least greatly expanded coverage from present status.

The following pages give island by island summaries of the water supply and environmental sanitation situations in the Eastern Caribbean.

ANNEX II-C-7

WATER SUPPLY SITUATION IN EACH TERRITORY

A. GRENADA - (Capital, St. Georges)

1. EXISTING

(a) Sources:	14 Surface, 2 Wells. Raw water quality good.
(b) Intakes:	Small impoundments for surface sources.
(c) Raw Water Mains:	Generally 4" diameter, cast iron. In fair condition.
(d) Treatment:	Generally plain sedimentation with slow sand filtration. Capacity very inadequate. Chlorination.
(e) Quality of Water:	Acceptable
(f) Service Reservoirs:	50% under capacity.
(g) Distribution Mains:	1-1/2" diameter to 8" diameter. Galv. iron, steel and cast iron.
(h) Distribution Service:	Poor. Inadequate consideration of topography taken into account in previous design. Service in principal town not continuous. Waste high.
(i) Age of Mains:	Average 45 years.
(j) Service Connections:	25% of population.
(k) Public Taps:	70% of population.
(l) Fire protection:	Generally none.
(m) Total Production:	Estimated at 4.0 MGD
(n) Population:	105,000 - 1966.
(o) Owner:	Government of Grenada.
(p) Responsible Organization:	Ministry of Communications and Works.
(q) Responsible Agency:	Public Works Department - Water Section.
(r) Investigation and Design Responsiblity:	Public Works Department - Water Section. No specific staff provided. In the past, generally delegated to Consultants. Design team headed by Engineer now being trained with PAHO/WHO assistance.

(s) Financing:	Recurrent - Government Revenue. Capital - C.D.W. Grants generally. Approximately $2.M dollars spent in last 6 years.
(t) Expenditures:	Covering administration, operation and maintenance - $261 000 estimated for 1966.
(u) Revenue:	From water rates based on a rental assessment valuation and in specific instances on metering - $300,000 estimated for 1966.
(v) Rates:	Paid into Government Treasury. Basis of rental assessments - 14% maximum. Hotels metered - 50¢ /1000 galls. Rates low in relation to production. Costs estimated at 95¢ per 1000 galls.
(w) General Remarks:	Adequately maintained and operated on the basis of sound administrative procedures and good engineering, the present production is adequate for current needs if certain sections of the systems are reinforced - coagulation, filtration capacity, service storage, replacement of small mains. The establishment of a distinct autonomous water organization, the return of water revenues to the funding of such an organization, the utilization of meters and a realistic rate based on quantity, can establish water supplies in Grenada on a sound footing.

2. PLANS FOR THE FUTURE

(a) Organization:	The present Government is dissatisfied with the existing arrangement for the management of the water supply situation. It is intended to create a Central Water Authority on a self supporting basis. With the help of PAHO/WHO draft laws have been prepared and is awaiting governmental action. Active opposition to the change of the status quo is being made. The Government has privately asserted its decision to proceed as planned.
(b) Overall Survey and Programme:	Approximately one year ago PAHO/WHO managed to convince the Government that progress in the water supply field can

only be achieved by the utilization of planning and design techniques and by the creation of this function internal to their organization. With the guidance and advice of PAHO/WHO a small government team of 1 counterpart engineer, 2 surveyors, 2 draughtsmen and 1 typist was formed. This team has undertaken under the general guidance of PAHO/WHO a survey of the existing water supply systems and has performed the design for an island wide construction programme for the future. The report is now being made ready for publication and should be out at the end of the year. The total cost of the planned improvements for a population equal to twice the existing one (25 yr. projection) is $9,000,000 and phasing should be over a 10 year period. Financing should be made only on the basis of individual project feasibility reports. The phasing recommended is as follows:-

1967 -	$ 500,000
1968 -	$ 800,000
1969 -	$1,000,000
1970 -	$1,500,000
1971 -	$1,900,000
1972 -	$1,500,000
1973 -	$ 600,000
1974 -	$ 500,000
1975 -	$ 400,000
1976 -	$ 300,000

(c) Staffing: The phasing recommended in 2.(b) will enable existing staff to cope with the initial situation and will permit a build-up of the required staff to full strength within the planned organization. No details on future staff requirements are possible since Government's final decisions on a water organization are still awaited.

(d) Training: PAHO/WHO will continue to do training of staff at the inservice level and in the granting of fellowships. It would be advisable for fellowships at a lower level to be also offered by PAHO/WHO.

(e) Construction Equipment: Equipment will be required at an estimated cost of $150,000.

(f) Construction Drawings:	This is included in the estimates above (2 b) and should be in the neighbourhood of 5% maximum depending on the build up of organizational staff.
(g) Metering:	Government plans that water should be metered but this is likely to be introduced after the formation of a water authority.
(h) Water Authority Finance:	The requirements for recurrent items will be approximately $300,000 p.a. rising to $500,000 p.a. in 5 years. Insufficient data is available at present to provide a clear picture of revenue but it has been estimated that if all water is accounted and paid for at 50¢ per 1000 galls.for conditions of 25% service connections and 70% public taps, the revenue should be over $700,000.00.
(i) Water Works Finance Capital:	See under 2 (b).

B. ST. VINCENT

1. EXISTING

(a)	Sources:	22 surface. Raw water quality good.
(b)	Intakes:	Small impoundments.
(c)	Raw Water Mains:	Generally 4" diameter - Cast Iron.
(d)	Treatment:	None.
(e)	Quality of Water:	Not acceptable.
(f)	Service Reservoirs:	Quite inadequate.
(g)	Distribution Mains:	1-1/2" dia. to 6" dia. Galv. iron and steel.
(h)	Distribution Service:	Poor
(i)	Age of Mains:	Average 50 years.
(j)	Service Connections:	10% population.
(k)	Public Taps:	60% of population.
(l)	Fire Protection:	None.
(m)	Total Production:	Estimated at 1.8 MGD.
(n)	Population:	93,000 - 1966.
(o)	Owner:	Government of St. Vincent.
(p)	Responsible Organization:	Ministry of Communications and Works.
(q)	Responsible Agency:	Public Works Department.
(r)	Investigation and Design Responsibility:	Public Works Department. No water engineer. Designs generally not performed.
(s)	Finance:	Recurrent: Government Revenues. Capital: C.D.W. grants generally.
(t)	Expenditure:	Recurrent expenditure, in 1965 - $68,000. Capital - $986,000 in last 10 years.
(u)	Revenues:	From water rates based on a rental assessment valuation. Figure N.A.
(v)	Rates:	Basis of a rental assessment valuation. Figure N.A. but very low and cannot cover operation and maintenance.

General Remarks: The St. Vincent waterworks systems are badly designed and constructed, and provide a very poor service for current needs. Treatment is non existent, service storage is minimal and service at the high levels is discontinuous. Planning is random and works are executed on the basis of drawings which are essentially sketches and which are prepared by untrained personnel. St. Vincent has never had a trained water engineer and is now waking up to this specific need.

The present systems can form the basis for an excellent water supply for St. Vincent if steps are taken to create a separate self

supporting organization for the sole purpose of dealing with water supplies. Raw water resources are very adequate.

2. PLANS FOR THE FUTURE

(a) Organization: The present government has expressed a desire to create a separate water supply organization which will take the form of a Water Authority and to this end PAHO/WHO has recently provided a consultant in this field. No forecasts can be made however as to when this is likely to take place.

(b) Overall Survey and Programme: The Government of St. Vincent is also desirous of carrying out a comprehensive survey of their water supply systems with a view to preparing a master programme for the whole territory. Technical advisory services will be given by a PAHO/WHO Consultant in water supplies. Formalization of an agreement between PAHO/WHO and government is awaited.

(c) Staffing: Assuming the creation of a Central Water Authority, all levels of staff will have to be trained from practically first principles since the level of expertise in this field is very low. A beginning has been made towards this when PAHO/WHO trained a candidate in the principles of water design to a technician's level, sufficient for the performance of hydraulic design calculations, surveys, estimates. The results of this training have been successful and much can be done with the material available in the island. Government has recently decided to try to secure the services of one of the recent engineering graduates of St. Vincent for the purpose of working on water supplies.

(d) Training: See under Staff.

(e) Construction Equipment: Inadequate at present, but will not exceed $150,000.

(f) Construction Drawings:	Provisions for this will be made in the overall programme when approved.
(g) Metering:	The Government's philosophy on this is not yet clear, but an estimate of $200,000 should be provided for the introduction of meters.
(h) Water Authority Finances:	No reliable figures are available.
(i) Water Works Finance (Capital):	It is, without the assistance of a study, difficult to forecast capital needs. It is estimated that a sum of $50,000 will be required for such a study which will last for from 12 to 15 months. Nevertheless, an approximate figure for Capital requirements should be in the vicinity of $7,000,000 phased over an 8 year period.

C. BARBADOS - (Capital - Bridgetown)

1. EXISTING

(a)	Sources:	2 springs - 8 dug wells.
(b)	Intakes:	Collecting chambers for springs.
(c)	Raw water mains:	Nil.
(d)	Treatment:	Chlorination - other not required.
(e)	Quality of water:	Good.
(f)	Service reservoirs:	Capacity inadequation placement faulty.
(g)	Distribution mains:	610 miles of sizes 3" to 20" diameter spun and cast iron.
(h)	Distribution service:	Fair.
(i)	Age of mains:	Average about 40 years.
(j)	Service connections:	45.3%. of population.
(k)	Public taps:	54.7% of population.
(l)	Fire protection:	Inadequate.
(m)	Total production:	13 MGD.
(n)	Population:	260,000.
(o)	Owner:	Government of Barbados.
(p)	Responsible Organization:	Ministry of Works.
(q)	Responsible Agency:	Waterworks Department.
(r)	Investigation and design responsibility:	Chief Engineer, Waterworks Department - a design group is being developed.
(s)	Financing:	Recurrent - Government Revenues. Capital - Government Revenues, Loans and CDW grants.
(t)	Expenditures:	Recurrent - $1.6 million. Capital - N.A.
(u)	Revenue:	$1.1 million.
(v)	Rates:	Basis-Rental assessment valuation and metering of commercial and industrial establishments.
(w)	General Remarks:	The Barbados Water System is operated and maintained by a Government Department which is doing a good job. A greater freedom of antonomy will do much to closing the deficit between expenditure and revenue. Administrative, financial, operating and maintenance procedures are always in the process of refinement and the future for the water supply situation is good.

2. PLANS FOR THE FUTURE

(a) Organization:	None.
(b) Overall survey and Programme:	With the assistance of the United Nations a resources survey was completed. At present a local team headed by an engineer is conducting a survey and design programme

	with the guidance of PAHO/WHO for updating the system. Completion of this study is expected at the end of 1967.
(c) Staffing:	Adequate for present needs. As needs demand technical staff will be expanded.
(d) Training:	In-service training is now being considered by the department. PAHO/WHO provides training in design, besides the granting of fellowships.
(e) Construction equipment:	Purchased in accordance with needs.
(f) Construction drawings:	Departmentally done. Adequate.
(g) Metering:	Metering to commercial and industrial houses and for gardening purposes. Domestic use not metered, except on request. Government has not declared its policy on domestic metering, but a capital provision of $500,000 would be necessary to initiate a metering programme.
(h) Water Authority Finance:	With improved rates the Department can become self supporting.
(i) Waterworks Finance Capital:	A design study is now being carried out. Present forecasts indicate a need for $23,000,000 phased over a 10 year period.

D. ST. LUCIA

1. EXISTING

(a)	Sources:	10 surface and 1 well. Raw water quality good.
(b)	Intakes:	Small impoundments.
(c)	Raw water mains:	Generally 4" diameter. Cast Iron.
(d)	Treatment:	Rapid gravity for Castries - chlorination - slow sand for others.
(e)	Quality of water:	Good.
(f)	Service reservoirs:	Not sufficient.
(g)	Distribution mains:	2" to 6" diameter. G.I. and cast iron.
(h)	Distribution service:	Poor.
(i)	Age of mains:	About 50 years average.
(j)	Service connections:	20% of population.
(k)	Public taps:	60% of population.
(l)	Fire protection:	Nil.
(m)	Total production:	1.4 MGD.
(n)	Population:	88,000.
(o)	Owner:	Government of St. Lucia.
(p)	Responsible organization:	Central Water Authority - 1 year old.
(q)	Responsible agency:	Central Water Authority - 1 year old.
(r)	Investigation and design responsibility:	Central Water Authority - Chief Engineer.
(s)	Financing:	Recurrent - Government subsidy until the Authority can get on its feet. Capital - CDW grants, Canadian aid.
(t)	Expenditures:	Figures not available.
(u)	Revenue:	Figures not available.
(v)	Rates:	Domestic - 70¢ per 1,000 gallons) Commercial-80¢ per 1,000 gallons) Proposed
(w)	General Remarks:	With the advice and guidance of PAHO/WHO, the Government of St.Lucia undertook a comprehensive survey and design report on the water supply situation in 1962/1963. On the basis of this report a Central Water Authority was formed and has been in existence for approximately 1 year. The progress made to date has been creditable but much consolidation work still remains to be done. Work has proceeded on the first phase of the Water Design Programme and stage 1 of the North West Coast project is completed and in operation. This project was financed by grants from U.K. and Canada. Finance has also been obtained for the Micoud and Morne Development projects. The completion of the overall programme will call for much additional financing for which sources have not yet been obtained.

2. PLANS FOR THE FUTURE

(a) Organization:	Organization needs to be strengthened but existing financial conditions prevent this. It is hoped that as soon as the new rates are introduced the picture will be clearer.
(b) Overall Survey and Programme:	Available.
(c) Staffing:	Adequate for present and immediate needs. 1 additional engineer required in 1 year's time. Technicians are needed.
(d) Training:	Considerable in-service training is required for surveyors, draughtsmen, engineers, accountants, administrative officers. PAHO/WHO will assist in this.
(e) Construction equipment:	Badly needed - funds are unavailable. It is hoped that this will become available when projects are financed.
(f) Construction drawings:	Executed by engineering staff of Water Authority and in specific cases by a local consultant to the Authority. (The former Water Works Engineer of St. Lucia).
(g) Metering:	Will be introduced. $250,000 required.
(h) Water Authority Finance:	It is hoped to base this on the revenue picture of the Authority as soon as metering can be introduced. With proper management, the Authority should become self supporting.
(i) Water Works Finance:	The updated picture of the Design Report shows that a capital sum of about $6.0 million will be required. Phasing should be over an 8-year period of approximately equal portions.

E. DOMINICA (Capital - Roseau)

1. EXISTING

(a)	Sources:	22 surface - raw water excellent.
(b)	Intakes:	Small impoundments.
(c)	Raw water mains:	Included in distribution mains.
(d)	Treatment:	None except in Goodwill where chlorination is employed.
(e)	Quality of water:	Should be regarded as contaminated.
(f)	Service reservoirs:	500,000 gallons - very inadequate.
(g)	Distribution mains:	300,000 ft. 1/2" ø G.I. to 8" C.I.
(h)	Distribution service:	Poor.
(i)	Age of mains:	About 80 years avarage
(j)	Service connections:	13.4% of population.
(k)	Public taps:	55.0% of population.
(l)	Fire protection:	Nil.
(m)	Total production:	789,000 GPD.
(n)	Population:	63,000 - 1966
(o)	Owner:	Government of Dominica.
(p)	Responsible organization:	Ministry of Communications and Works.
(q)	Responsible agency:	Public Works Department.
(r)	Investigation and design responsibility:	Public Works Department - Director
(s)	Financing:	Recurrent - Government Revenues. Capital - CDW Grants.
(t)	Expenditures:	Recurrent - Expenditure 1962 - $35,000 Capital - N.A.
(u)	Revenue:	$12,000 p.a. 1963.
(v)	Rates:	Based on rental assessment valuations. Minimum $2.40 p.a.
(w)	General remarks:	The Water Works systems in the island of Dominica are the most primitive in the West Indies. This is probably because this island is the best watered of all. Recently the Government has been convinced of the usefulness of a separate water organization and with the assistance of PAHO/WHO draft laws have been made for the creation of this authority. Action is still awaited. A comprehensive survey and design on the water supply situation has been carried out by the Government in 1963 with the assistance and guidance of PAHO/WHO but to date no action has been taken to implement the recommendations.

2. PLANS FOR THE FUTURE

(a) Organisation:	The Government has expressed its desire to create a Water Authority for the water systems of the island and with the advice and assistance of PAHO/WHO draft laws have been prepared. No further action has materialized but it is anticipated that action will be taken in another 6-9 months. The prospects of financial assistance can do much to accelerate matters in this field.
(b) Overall survey and Programme:	Available in the form of a report with drawings. Base Line Design Report - October 1964 - published by Government of Dominica and PAHO/
(c) Staffing:	Available staff at the administrative and technical level is available. Subordinate staff is also available but will require training. PAHO/WHO will continue to assist in this.
(d) Training:	Training of the inservice type is required and will be conducted by PAHO/WHO as the need arises. The creation of a water organisation will accelerate this need.
(e) Construction equipment:	The island is fairly well supplied with construction equipment, but some additional equipment will be required if a construction programme is initiated. Cost is approximately - $200,000.
(f) Construction drawings:	Will be prepared by local staff and costed into the project.
(g) Metering:	The Government asserts that the creation of a water authority will mean a rational introduction of metering consequently a provision of $100,000 will be initially required.
(h) Water Authority Finance:	Under present circumstances it is difficult to assess to what extent a water supply undertaking can be made self supporting. It is probable that in the first 2-3 years of life of such an undertaking losses will occur, but once the consumers get

2. (i) Water Works Finance Capital:

The requirement updated to the present is about $7.0 million and a suitable phasing is:

Year 1	-	$600.000
2	-	$450.000
3	-	$500,000
4	-	$600,000
5	-	$700,000
6	-	$1,000,000
7	-	$900,000
8	-	$800,000
9	-	$800,000
10	-	$700,000

F. MONTSERRAT (Capital - Plymouth)

1. EXISTING

(a)	Sources:	Springs essentially.
(b)	Intakes:	Small collecting chambers.
(c)	Raw water mains:	Size N.A.
(d)	Treatment:	None.
(e)	Quality of water:	Good.
(f)	Service reservoirs:	Very inadequate.
(g)	Distribution mains:	Sizes and length N.A.
(h)	Distribution service:	Poor. Faculty design.
(i)	Age of Mains:	N.A.
(j)	Service connections:	N.A. About 15%.
(k)	Public taps:	N.A. About 85%.
(l)	Fire protection:	None.
(m)	Total production:	750,000. GPD.
(n)	Population:	14,000 - 1966.
(o)	Owner:	The Government of Montserrat.
(p)	Responsible Organisation	The Ministry of Communications and Wc.
(q)	Responsible agency:	The Public Works Department.
(r)	Investigation and design responsibility:	The foreman Plumber
(s)	Financing:	Recurrent - Government Revenue Capital - Grants (CDW)
(t)	Expenditures:	N.A.
(u)	Revenue:	N.A.
(v)	Rates:	N.A.
(w)	General Remarks:	The situation in Montserrat is not hopeless since on the present production claimed, the per capita provisic is 53.5 gpd - a liberal amount. Before any money is required a comprehensive survey and report on the same basis and similar to that carrie out by the Governments of Dominica, Grenada and St. Lucia should be prepared. Unfortunately, the financial picture of Monserrat does not permit the diversion of funds ($40,000) for this purpose.

2. PLANS FOR THE FUTURE

(a)	Organisation:	Recently the Government has expressed a desire to have a PAHO/WHO engineer assist in the analysis of their situa tion towards the formation of a water authority. This should be seriously pursued. Estimated cost of study will be $40,000 for a 15 month study.
(b)	Overall survey	

(c)	Staffing:	Very poor. Intensified training required at all levels.
(d)	Construction equipment:	Equipment required. Estimated cost $ 50,000
(e)	Construction designs:	To be investigated.
(f)	Metering:	Metering will eventually be required here at an initial cost of $50,000.
(g)	Water Authority Finance (Recurrent)	A study will be required.
(h)	Water Authority Finance (Capital)	A capital outlay of $40,000 is requi: for the preparation of a programme. approximate estimate of project capita costs will be about $2,500,000 spent over an 8 year period.

G. ANTIGUA (Capital - St.John's)

1. EXISTING

(a)	Sources:	Wells and surface sources.
(b)	Intakes:	Small dams. Well screens.
(c)	Raw water mains:	See under distribution mains.
(d)	Treatment:	Rapid gravity for surface sources.
(e)	Quality of water:	Fair.
(f)	Service reservoirs:	Insufficent.
(g)	Distribution mains:	3" to 12" cast iron.
(h)	Distribution service:	Poor. Intermittent. 2-4 hours.per day.
(i)	Age of Mains:	N.A.
(j)	Service connections:	14%
(k)	Public taps:	86%
(l)	Fire protection:	Nil.
(m)	Total production:	700,000 GPD.
(n)	Population:	61,500.
(o)	Owner:	The Government of Antigua.
(p)	Responsible organization:	The Ministry of Communications and Works.
(q)	Responsible agency:	The Public Works Department.
(r)	Investigation and design responsibility:	The Public Works Department.
(s)	Financing:	Recurrent: Government Revenues Capital: Grants (CDW)
(t)	Expenditures:	N.A.
(u)	Revenue:	N.A.
(v)	Rates:	(1) Rental assessments, (2) Meters (3) Truck loads.
(w)	General Remarks:	In this island there are no permanent streams, but the average rainfall is approximately 42 inches per year. Flash floods are of appreciable magnitude; and geologically, the ground water potential appears appreciable. A lot of work has been done in Antigua but it has been of such a casual and random fashion that the results are highly unreliable. In 1965, the Government of Antigua was assisted by PAHO/WHO in the preparation of a preliminary report on the development of the water supplies of the island. From this report it is obvious that the general solution, barring eventual desalinisation, lay in the development of the ground water and surface runoff potential. An efficient solution, under the particular conditions existing, will call for much more information and in much greater detail than is presently available.

2. PLANS FOR THE FUTURE

(a) Organisation:	It seems fairly certain that Government intends to form a Water Department distin.. from the Public Works Department. The difficulty surrounding this is the absen(of a local engineer trained in water and the low level of training in the relevant supporting staff.
(b) Overall Survey and Programme:	In 1965, PAHO/WHO assisted the Government in the preparation of a "preliminary Repor on Community Water Supply". Further stu(are indicated and a final programme shou be prepared befcre large scale capital expenditure is initiated. That part of t' continuation studies involving ground wa(will promote some construction work so tha immediate benefits may be derived from th investigation for the easing of the crit: cal situation which exists. Therefore, a sum over and above the requirements for th study should be provided initially. The Government has recently negotiated wi.. the Canadian Aid Department to assist in the preparation of a comprehensive programme. The details are not known.
(c) Staffing:	At the technical level this is practicall.. non existent and the Government will have to pay serious attention to this.
(d) Training	PAHO/WHO will continue to assist in this, as there is a big backlog of work to be done.
(e) Construction equipment:	The needs here will be dependent on the emphasis in the final programme. If large impounding dams are feasible then consider able equipment will be required. If dams are constructed in association with groun.. water recharge aspects less will be required. A nominal sum of $100,000 has been included in Appendix 1.
(f) Construction Drawings:	See 2b.
(g) Metering:	No information on the Government's intention is available.

(h)	Water Authority (Department) Finance:	The trend is not clear.
(i)	Water Works Finance -Capital:	Presumably the Canadian Government will provide this. It is estimated that a sum of 7,000,000 dollars will be required over a 7-year period.

H. St. KITTS - (Capital Basseterre)

1. Existing

(a)	Sources:	Surface.
(b)	Intake:	Small impoundments.
(c)	Raw water mains:	4 - 5" Cast Iron - length not available.
(d)	Treatment:	Chlorination.
(e)	Quality of water:	Good.
(f)	Service Reservoirs:	Inadequate in capacity.
(g)	Distribution mains:	2" - 6" Cast Iron.
(h)	Distribution Service:	Good.
(i)	Age of mains:	60 years average.
(j)	Service connections:	20% of Population.
(k)	Public taps:	80% of Population.
(l)	Fire protection:	Nil.
(m)	Total Production:	1.4 MGD.
(n)	Population:	62,000 (1966).
(o)	Owner:	The Government of St. Kitts.
(p)	Responsible Organisation:	Ministry of Communications and Works -Water Section.
(q)	Responsible agency:	Water Section of Ministry of Communications and Works.
(r)	Design Responsibility:	Water Section of Ministry of Communications and Works. No formal design done
(s)	Financing:	(Recurrent - Government Revenues. (Capital - C D W grants.
(t)	Expenditures:	Recurrent - N.A. Capital - N.A.
(u)	Revenues:	About $80,000 p.a.
(v)	Rates:	1. Meters which are being introduced at about 200 per year. 2. Rent assessment valuation for those not metered.
(w)	General Remarks:	A proper water supply organization is required. Much investigational work is required and this should be carried out by local teams in the same manner adopted by Grenada.

2. Plans for the Future.

Nothing is known of the future plans in St. Kitts. It appears they are well satisfied with the situation. It is definite that a comprehensive assessment of the situation should be initiated. PAHO/WHO has endeavoured to get them on this course but without success to date.

In order to give an approximate total assessment of the capital needs of the area a provision of $4,000,000 over an 8-year period has been included in the table at Appendix 1 for St. Kitts.

D. National Financing Mechanisms

The provision of health services is considered, in general, to be the legal responsibility of the Ministries of Health. The private sub-sector in most of the Caribbean is quite small and for profit in nature. The great majority of the population must rely on the public sub-sector or (Ministry of Health) to provide services. Services provided and health budget figures were available for only three of the smaller (less-developed) Caribbean states; Antigua, Grenada and St. Lucia. Only St. Lucia and Grenada break down services and responsibility by types and numbers as seen in Tables II-D-1 to II-D-3.

Tables II-D-4 to II-D-8 show the percentage distribution of the annual public budget by sector from 1965-1970 for Antigua, Dominica, Grenada, Montserrat and St. Vincent. Table II-D-9 shows a comparative breakdown around 1972 of the annual budgets spent on health as a per capita expenditure. The mean "current expenditure" percentage of the total budget spent on health for 1965 for Antigua, Dominica, Grenada, Montserrat and St. Vincent was 14.51%; around 1972 according to Table II-D-9 for the same countries[1] that percentage was 11.97%; a decrease of 2.54%. The mean percentage for 1972 for the less-developed Caribbean was

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[1] Excluding Grenada.

TABLE II-D-1. ..

ANTIGUA

Provision of Services and Facilities in the Health Sector by Agencies or Institutions and their Legal Responsibility and Budget Year 1969

Health Sector Agency or Institution	Legal responsibility in coverage (persons in thousands)	Budget for direct provision of services and facilities for health	Services provided					Resources provided			
			Social assistance	Research	Training	Medical attention	Other health services	Construction of facilities	Water supply and sewerage systems	Biological products and other medical supplies	Other supplies
ublic Sub-sector											
Government											
With health as principal objective											
ledical Division	63.000					x	x				
With health not as principal objective											
'ater Division	63.000						x		x		
ecentralized agencies											
With health as principal objective											
With health not as principal objective											
Social Security											
ther											
rivate Sub-sector											
Non-profit agencies											
Agencies operating on a profit-making basis											

TABLES II-D-2

GRENADA

Provision of Services and Facilities in the Health Sector by Agency or Institution and their legal responsibility and budget 1970.

Health Sector Agency or Institution	Legal responsibility (000, people)	Budget for direct provision of services and facilities ($000 US. Cy.)	Services Provided					Resources Provided			
			Social Assistance	Research	Training	Medical Care	Other health Services	Construction of Facilities	Water and Sewerage	Biological and other medical supplies	Other Supplies
Public Sub-sector Government											
With Health as principal Objective											
(a) Ministry of Health	106	1,281	x		x	x	x	x			
(b) Central Water Comission	106	1,081							x		
With Health not as principal objectives											
Decentralized Agencies											
(a) With Health as principal objective											
(b) With Health not as principal objective											
Other											
Private Sub-sector											
Non-profit agencies											
(a) Family Planning Association	106	n. a.					x				
(b) Kennedy Home	n. a.	n. a.	x			x	x				
Agencies operating on a profit-making basis											
(a) Salus Nursing Home		n. a.				x					
(b) Maternity Home		n. a.				x					

TABLE II-D-3 ST. LUCIA

Provision of Services and Facilities in the Health Sector by Agencies or Institutions and Their Legal Responsibility and Budget Year 1968

Health Sector Agency or Institution	Legal responsibility in coverage (persons in thousands)	Budget for direct provision of services and facilities for health	Services provided					Resources provided			
			Social assistance	Research	Training	Medical attention	Other health services	Construction of facilities	Water supply sewerage systems	Biological products and other medical supplies	Other supplies
Public Sub-sector Government With health as principal objective											
Ministry of Health	116,849		X	X	X	X	X	X			
With health not as principal objective											
Central Water Authority *	116,849	379,366					X	X	X		
City Council **	Castries	162,355					X	X		X	
Decentralized agencies With health as principal objective											
With health not as principal objective Social Security											
Other											
Private Sub-sector Non-profit agencies											
Family Planning Assoc.	Voluntary	14,366.93					X				
Agencies operating on a profit-making basis											
St. Jude Hospital ***	not defined					X					

TABLE II-D-4

ANTIGUA

Health expenditures in the public sector

Percentage distribution of the Annual Public Budget by sector in the last five years

A. For current expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	8,707321	100	10,599,187	100	15,909434	100	15,889,493	100	16,660,789	100
Health	1,512,005	17.4	1,589,701	15.0	1,788,002	11.2	2,002,761	12.6	2,254,154	13.5
Housing	70,693	0.8	73,459	0.7	62,701	0.4	67,93[illegible]	0.4	150,70[illegible]	0.9
Education	1,114,337	12.8	1,173,102	11.1	1,266,169	8.0	1,397,811	8.8	1,960,981	11.8
Economic	3,140,907	36.1	3,677,742	34.7	4,024,404	25.3	7,394,11[illegible]	46.5	5,355,48[illegible]	32.1
Other	2,869,383	33.0	4,085,093	38.5	8,768,158	55.1	5,027,564	31.6	6,940,359	41.7

B. For capital expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	6,299,427	100	7,874,546	100	4,344,015	100	779,900	100	594,900	100
Health	-	-	45,900	0.6	81,900	1.9	80,000	10.3	32,000	5.4
Housing	15,735	0.2	41,520	0.5	12,900	0.3	6,000	0.8	-	-
Education	-	-	499,567	6.3	1,361,904	31.4	-	-	30,000	5.0
Economic	4,046,093	64.2	1,288,280	16.4	2,553,602	58.8	304,954	39.1	496,100	83.4
Other	2,236,599	35.5	5,999,360	76.2	334,440	7.7	388,946	49.9	36,800	6.2

* The monetary unit should be specified E.C. $

Source: Revised estimates

Comment: Reliability: Reliable only as a trend in the Government expenditure pattern. Estimated capital expenditures tend to be less reliable though current expenditure is an approximation to actual expenditure figures.

Note 1: Economics: 1) Public Works and Communications
2) Agriculture
3) Peasant development programe
4) Trade and Production.

Note 2: Water Division included in Public Works and Communications.

TABLE II-D-5

DOMINICA

Health expenditures in the public sector

Percentage distribution of the Annual Public Budget by sector in the last five years

A. For current expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	6,245,021	100	6,927,316	100	7,298,960	100	8,066,258	100	9,346,826	100
Health	978,226	15.68	1,033,149	14.91	1,116,131	15.29	1,211,947	15.02	1,236,734	13.23
Housing	71,730	1.14	81,741	1.18	86,370	1.18	104,218	1.29	-	
Education	1,125,523	18.02	1,214,117	17.53	1,226,007	16.81	1,342,360	16.64	1,473,727	15.76
Economic a)	1,635,087	26.09	2,064,857	29.81	1,978,780	27.11	2,274,082	28.19	2,503,371	26.78
Other	2,384,455	38.19	2,533,453	36.57	2,890,763	39.61	3,133,702	38.86	4,132,999	44.22

B. For capital expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	2,162,102	100	1,586,416	100	1,160,475	100	1,997,996	100	2,352,524	100
Health	43,905	2.03	129,006	8.13	44,320	3.82	3,101	0.16	54,002	2.29
Housing	-	-	-	-	-	-	-	-	-	-
Education	146,901	6.79	-	-	6,408	0.55	37,223	1.87	429,979	18.27
Economic a)	1,715,133	79.33	-	-	988,866	85.22	1,946,892	97.97	1,724,746	73.33
Other	256,164	11.85	1,457,410	91.87	120,881	10.41	-	-	143,797	6.11

* The monetary unit should be specified E.C. $

Source: Actual expenditures, National Estimates.

Comment: Information reliable but must be considered in the light of footnotes to table 6100 and 6200.

a). Economics figures obtained by selecting items directly related to the economic development of the Islands from the departments of Communications and Work, Trade and Industry.

TABLE II-D-6

GRENADA

Health expenditures in the public sector

Percentage distribution of the Annual Public Budget by sector in the last five years

A. For current expenditures*

Sector	Years									
	1970 (2)		1969 (2)		1968 (2)		1967		1966	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	7,819	100	6,954	100	5,634	100	4,833	100	4,021	100
Health	1,176	15.0	1,010	14.5	833	14.8	798	16.5	644	16.0
Housing	8	0.1	6	0.1	6	0.1	-(4)	-	-(4)	-
Education	1,413	18.1	1,322	19.0	1,127	20.0	998	17.1	789	19.6
Economic	670	8.6	641	9.2	488	8.7	474	9.8	386	9.6
Other	4,552	58.2	3,975	57.2	3,130	56.4	2,563	56.6	2,202	54.8

B. For capital expenditures*

Sector	Years									
	1970		1969		1968		1967		1966	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	4,911	100	3,318	100	2,078	100	1,801	100	1,070	100
Health	105	2.1	37	1.1	64	3.1	27	1.5	62	5.6
Housing	125	2.5	100	3.0	100	4.8	-(4)	-	-(4)	-
Education	992	20.2	568	17.1	519	25.0	171	9.5	228	21.3
Economic	2,214	45.1	937	28.2	802	38.6	281(5)	15.6	429(5)	40.1
Other	1,475	30.1	1,676	50.6	593	28.5	1,322	73.4	351	33.0

* The monetary unit should be specified - U.S. dollars, in thousands

Source: Estimates, Grenada, 1966 through 1970

Comment: (1) Consolidated expenditures net of debt redemption.

(2) At the end of 1967 the Eastern Caribbean dollar was devalued from E.C. $ 1.7 = U.S. $ 1 to EC$ 2 = U.S. $ 1.

(3) In constructing the above Table, the U.N. Economic and functional classification for Government Transactions was followed. Expenditures for water and sewerage are therefore included in all other (community services) along with roads and highways.

(4) One housing project for civil servants completed in 1965.

(5) Budgetary classification was modified in 1967, and expenditures for economic infrastructure were merged with other projects,

TABLE II-D-7

MONTSERRAT

Health expenditures in the public sector

Percentage distribution of the Annual Public Budget by sector in the last five years

A. For current expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	2,604,956	100	2,821,647	100	3,252,046	100	3,738,376	100	3,898,584	100
Health	266,586	9.9	213,553	7.6	273,732	8.4	365,787	9.8	355,941	9.1
Housing	-	-	-	-	-	-	-	-	-	-
Education	363,057	13.5	325,751	11.5	365,653	11.2	347,749	9.3	348,022	8.9
Economic	1,054,870	39.1	1,172,374	41.5	1,851,278	56.9	818,204	21.9	1,057,140	27.1
Other	1,011,364	37.5	1,109,969	39.3	761,383	23.4	2,206,036	59.0	2,137,481	54.8

B. For capital expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	676,630	100	1,616,210	100	1,106,977	100	645,404	100	786,526	100
Health	11,503	1.7	1,693	0.1	20,631	1.9	10,854	1.7	25,137	3.2
Housing	-	-	4,210	0.3	-	-	--	-	-	-
Education	47,144	7.0	78,588	4.9	14,961	1.3	76,978	11.9	193,143	24.6
Economic	421,737	62.3	1,206,134	74.6	1,011,150	91.3	500,467	77.5	495,603	63.0
Other	196,254	29.0	325,583	20.1	60,335	5.5	57,105	8.8	72,643	9.2

* The monetary unit E. C. $

Source: Actual Expenditures, Treasury Dept.

Comment: Information is complete and reliable
Economics = Agriculture, Communications and Works and Tourism.

TABLE II-D-8

ST. VINCENT

Health expenditures in the public sector

Percentage distribution of the Annual Public Budget by sector in the last five years

A. For current expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	6,774,709	100	7,346,671	100	7,769,459	100	8,649,464	100	11,238,423	100
Health	922,417	13.6	1,184,035	16.1	1,189,323	15.3	1,277,244	14.8	1,414,557	12.6
Housing	37,647	0.6	46,960	0.6	42,406	0.5	55,904	0.6	128,417	1.1
Education	1,175,241	17.3	1,437,290	19.6	1,584,546	20.4	1,760,956	20.4	1,665,150	14.8
Economic	984,078	14.5	1,079,241	14.7	906,840	11.7	744,662	8.6	623,496	5.5
Other	3,641,996	53.8	3,583,694	48.8	4,022,629	51.8	4,767,028	55.1	7,406,778	65.9

B. For capital expenditures*

Sector	Years									
	1965		1966		1967		1968		1969	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	1,251,04	100	1,704,953	100	1,177,489	100	1,419,421	100	4,659,000	100
Health	59,164	4.7	29,999	1.8	34,528	2.9	127,800	9.0	45,000	1.0
Housing	9,919	0.8	54,497	3.2	8,954	0.8	9,261	0.7	150,000	3.2
Education	122,875	9.8	186,101	10.9	86,909	7.4	166,504	11.7	412,450	8.9
Economic	716,943	57.3	870,112	51.0	567,699	48.2	616,747	43.5	3,097,800	66.5
Other	342,144	27.3	564,244	33.1	479,501	40.7	498,109	35.1	953,840	20.5

* The monetary unit should be specified E.C. $

Source:

Comment: Information is reliable. Figures for housing do not provide accurate information on total expenditures; other ministries and departments may spend considerable amounts in Housing, but actual information is not available.

TABLE II-D -9

Total Government Expenditures and Expenditures for Health, by Country, around 1972
(National Currency in Thousands)

Area	Year	Total	Health		
			Total		
			Amount	Per cent	Per capita (USA $)
Antigua (a)	1972	32 494	4 478	13.8	30.07
Argentina (b)	1969	1 610 402 000	81 187 900	5.0	10.15
Bahamas (c)	1972	...	12 770	...	69.29
Barbados	1972-73	128 009	19 945	15.6	40.74
Belize (c)	1972	25 288	1 947	7.7	9.69
Bolivia	1972	6 482 645	242 496	3.7	2.33
Brazil (d)	1972	32 176 800	817 600	2.5	1.33
Canada	1970-71	...	4 967 600	..	229.53
Chile	1972	36 618 200	b) 5 596 900	15.3	22.12
Colombia (d)	1972	22 179 600	1 664 300	7.5	3.23
Costa Rica (d)	1969	809 600	47 200	5.8	4.23
Dominica	1970	15 223	1 854	12.2	13.05
Dominican Republic	1970	253 489	39 518	15.6	9.72
Ecuador (d)	1972	6 190 000	155 000	2.4	0.95
El Salvador	1971	336 252	39 138	11.6	4.41
French Guiana (c)	1972	...	342	...	1.31
Grenada	1972	...	4 236	...	21.63
Guatemala	1972	250 946	b) 21 653	8.6	4.00
Guyana (c)	1972	...	13 261	...	7.92
Haiti	1972	147 900	19 755	13.4	0.78
Honduras (d, e)	1971	235 400	18 000	7.6	3.42
Jamaica (d)	1972-73	362 567	36 583	10.1	22.33
Mexico (d, e)	1970	27 285 400	1 619 000	5.9	2.64
Montserrat	1972	5 701	554	9.7	22.63
Nicaragua (a)	1970	686 218	152 214	22.2	10.92
Panama (a)	1972	...	25 437	...	16.69
Panama Canal Zone	1969-70	...	16 537	..	375.84
Paraguay	1972	d) 11 774 500	1 987 843	16.9	6 11
Peru	1972	115 605 000	6 902 000	6.0	12.34
Puerto Rico	1969-70	1 179 000	164 400	13.9	60.37
St. Kitts-Nevis and Anguilla	1972	14 266	1 835	12.9	13.84
St. Lucia	1972	32 476	2 855	8.8	12.17
St. Vincent	1970	15 445	1 884	12.2	10.58
Surinam	1971	...	176 978	...	246.27
Trinidad and Tobago	1972	465 114	56 088	12.1	26.36
United States (d)	1971-72	448 466 000	31 045 000	6.9	149.09
Uruguay	1970	...	11 506 900	..	15.95
Venezuela	1971	10 928 000	2 024 858	18.4	42.92
Virgin Islands (UK)	1972	6 005	501	8.3	41.75

(a) Current expenditures. (b) Ministry of Health. (c) From the Fifth Report on the World Health Situation, 1969-1972, Part II, World Health Organization. (d) From the Statistical Yearbook 1973, United Nations. (e) Estimate.

10.7%. For the more developed countries[2] that percentage was 12.6%. The per capita expenditure for health by the central governments around 1972 averaged $19.49 in the less developed countries and $29.81 in the more developed.[3] The highest expenditure per capita was recorded in the British Virgin Islands at $41.75 and the lowest was recorded in Belize where $9.69 was expended per capita. As the PAHO/WHO Quadrennial Projections points out the comparability of data between reporting countries is suspect in that it is unclear whether the data refers to the budget of the central government or to consolidated expenditures of the public sector. Furthermore, it is not clear how intra governmental transfer or duplication of funding is handled in the tables. It does, however, provide a rough estimate both of the priority placed on health by the individual governments and the relative level of dollars being spent per capita.

Data for five countries on the budget of the health sector by object and allocation of expenditures by agency is shown in Tables II-D-10 to II-D-17. While the figures for Antiqua (water services) appear highly suspect, the remainder of the data seems to present good information on breakdown of health sector

[2] Barbados, Jamaica, Trinidad and Tobago (excluding Guyana) as above

[3] Ibid.

Budget of health sector by object and allocation of expenditure, by agency*

DOMINICA

Agency Ministry of Health

Fiscal year** 1968

Object Expenditure \ Purpose	TOTAL		Medical Care		Other health services*		Training		Research		Production Of biol. and other subs.		Adminis-tration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures	112,446	32.82	363,606	15.99	42,485	34.93	180	.40	-	-	-	-	6,415	8.11	-	-
Personnel	211,623	64.60	618,040	61.18	76,008	62.52	45,437	99.60	-	-	-	-	72,138	91.30	-	-
Other	29,178	2.35	28,682	2.83	-	-	-	-	-	-	-	-	496	.60		
ii Capital expenditures	3,101	.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Real investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water supply and sewerage systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	3,101	2.55	-	-	3,101	2.55	-	-	-	-	-	-	-	-	-	-
Fin. investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total																
iii Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal	240	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total																
GRAND TOTAL	256,588	100	1,010,328	100	121,594	100	45,617	100	-	100	-	100	79,049	100	-	100

* Specify monetary unit E. C. $

** Fiscal year -

Sources: Actual expenditures, National Estimates.

Comment: Information reliable.

TABLE II-D-10

GRENADA

Budget of health sector by object and allocation of expenditure, by agency*

Agency Ministry of Health

Fiscal year** 1970

Purpose / Object Expenditure	TOTAL		Medical Care		Other health services**		Training		Research		Production Of biol. and other subs.		Adminis-tration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures																
Personnel	650	51	451	54	45	24	81	95	-	-	-	-	73	43	-	-
Other	489	38	305	36	120	65	1	2	-	-	-	-	63	37	-	-
ii Capital expenditures																
Real investment																
Construction	55	4	52	7	-	-	-	-	-	-	-	-	-3	2	-	-
Water supply and sewerage systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	50	4	27	3	19	11	2	3	-	-	-	-	2	1	-	-
Fin. investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total	1,244	97	835	100	184	100	84	100	-	-	-	-	141	83	-	-
iii Transfers																
Internal	26	2	-	-	1	-	-	-	-	-	-	-	22	13	3	50
External	11	1	-	-	-	-	1	-	-	-	-	-	7	4	3	50
Sub-total																
GRAND TOTAL	1,281	100	835	100	185	100	85	100	-	100	-	100	170	100	6	100

* Specify monetary unit U.S. dollars, in thousands

** Fiscal year -

Sources: Grenada Estimates, 1970

Comment:

TABLE II-D-11

MONTSERRAT

Budget of health sector by object and allocation of expenditure, by agency*

Agency _____ Fiscal year** 1969

Object Expenditure \ Purpose	TOTAL		Medical Care		Other health services**		Training		Research		Production Of biol. and other subs.		Adminis-tration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures	355,941	93.4	227,386	90.0	104,039	99.8							24,276	1.00		
Personnel	188,514	49.5	188,514	74.6												
Other	167,427	43.9	38,872	15.4	104,039	99.8							24,276	1.00		
ii Capital expenditures	25,137	6.6	25,137	10.0												
Real investment																
Construction																
Water supply and sewerage systems																
Equipment																
Fin. investment																
Sub-total																
iii Transfers																
Internal					240	0.2										
External																
Sub-total																
GRAND TOTAL	381,078	100	252,523	100	104,279	100		100		100		100	24,276	100		100

TABLE III-D-12

* Specify monetary unit E.C. $

** Fiscal year _____ - _____

Sources: Actual Expenditures, Treasury Dept.

Comment: Information complete and reliable.

Budget of health sector by object and allocation of expenditure, by agency*

Agency Ministry of Health Fiscal year** 1969

Object of expenditure \ Purpose	TOTAL		Medical Care		Other health services**		Training		Research		Production Of biol. and other subs.		Adminis-tration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures	1,414,557	96.9	862,820	98.3	524,408	94.6							27,329	100		
Personnel	890,149	61.0	862,820	98.3									27,329	100		
Other	524,408	35.9			(1) 524,408	94.6										
ii Capital expenditures	45,000	3.1	15,000	1.7	30,000	5.4										
Real investment																
Construction	30,000	2.1			30,000	5.4										
Water supply and sewerage systems																
Equipment	15,000	1.0	15,000	1.7												
Fin. investment																
Sub-total																
iii Transfers																
Internal																
External																
Sub-total																
GRAND TOTAL	(2) 1,459,557	100	877,820	100	554,408	100		100		100		100	27,329	100		100

* Specify monetary unit E.C. $

** Fiscal year -

Sources: Office of the Accountant General

Comment: (1) No further breakdown of figures, but most of it applies to Other Health Services and to Medical Care.

(2) Total Health Budget plus total capital expenditures.

Information is reliable.

Budget of health sector by object and allocation of expenditure, by agency*

Agency Central Water Authority

Fiscal year** 1970

Object of expenditure \ Purpose	TOTAL		Medical Care		Other health services**		Training		Research		Production Of biol. and other subs.		Administration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures	63,200	13.3	-	-	62,700	21.21	500	100	-	-	-	-	-	-	-	-
Personnel	69,022	14.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	31,560	6.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ii Capital expenditures	308,800	65.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Real investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction	230,000	18.6	-	-	230,000	61.91	-	-	-	-	-	-	-	-	-	-
Water supply and sewerage systems	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	78,800	16.6	-	-	78,800	21.21	-	-	-	-	-	-	-	-	-	-
Fin. investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	--	-	-	-	-	-	-	-	-	-	-
iii Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
External	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total																
GRAND TOTAL	472,582	100	-	100	371,500	100	500	100	-	100	-	100	-	100	-	100

* Specify monetary unit E.C. $

** Fiscal year -

** Programs may be specified if desired

Sources: Central Water Authority

Comment: Central Water Authority started operations in 1969. It has limited staff & administrative and technical functions are not easily identifiable. No further breakdown of figures was available. Information is reliable.

GRENADA

Budget of health sector by object and allocation of expenditure, by agency*

Agency Central Water Commission

Fiscal year** 1970

Purpose / Object Expenditure	TOTAL		Medical Care		Other health services*		Training		Research		Production Of biol. and other subs.		Adminis-tration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures																
Personnel	43	4	-		37	4	-		-		-		6		-	
Other	137	13	-		125	12	-		-		-		12		-	
ii Capital expenditures																
Real investment																
Construction	-		-													
Water supply and sewerage systems	860	79	-		860	83	-		-		-		-		-	
Equipment	4	1	-		4	1	-		-		-		-		-	
Fin. investment																
Sub-total	1,044	97	-		1,026	100	-		-		-		18	33	-	
iii Transfers																
Internal	-		-		-											
External	37	3	-		-		-		-		-		37	67	-	
Sub-total																
GRAND TOTAL	1,081	100	-	100	1,026	100	-	100	-	100	-	100	-	100	-	100

TABLE II-D-15

* Specify monetary unit U.S. dollars, in thousands

** Fiscal year -

Sources: Grenada Estimates, 1970

Comment:

ST. VINCENT

Budget of health sector by object and allocation of expenditure, by agency*

Agency Central Water Authority

Fiscal year** 1970

Object of Expenditure / Purpose	TOTAL		Medical Care		Other health services**		Training		Research		Production Of biol. and other subs.		Adminis-tration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures	139,535	66.9			76,390	52.5							63,845	100		
Personnel	75,865	36.4			18,620*	12.8							57,245	90.7		
Other	63,670	30.5			57,770*	39.7							5,900	9.3		
ii Capital expenditures	69,000	33.1			69,000	47.5										
Real investment																
Construction	35,000	16.8			35,000	24.1										
Water supply and sewerage systems																
Equipment	34,000	16.3			34,000	23.4										
Fin. investment																
Sub-total																
iii Transfers																
Internal																
External																
Sub-total																
GRAND TOTAL	208,535	100		100	145,390	100		100		100		100	63,845	100		100

ATBLE II-C-16

* Specify monetary unit E.C. $

** Fiscal year -

Sources: Central Water Authority and Official Budget Estimates

Comment:
1) Figures refer to Fiscal period 1970 and are the Official Budget Estimates. C.W.A. started operations in 1970. It has responsibility over entire population.
2) Above estimates do not include 1.1 million financial aid granted by Canadian Government to be employed in the improvement and development of water services.
3) Expected deficit by end of fiscal year (Dec. 70): 100,000

* Funds directly assigned to water supply services.

Budget of health sector by object and allocation of expenditure, by agency*

Agency Water Services

Fiscal year** 1969

Object Expenditure \ Purpose	TOTAL		Medical Care		Other health services**		Training		Research		Production Of biol. and other subs.		Administration		Social Welfare	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
i Current expenditures	69,089	47.8														
Personnel	13,037	9.0														
Other	56,043	38.8														
ii Capital expenditures	6,500	4.5			6,500											
Real investment																
Construction					6,500											
Water supply and sewerage systems																
Equipment																
Fin. investment																
Sub-total																
iii Transfers																
Internal																
External																
Sub-total																
GRAND TOTAL	144,560	100		100	6,500	100		100		100		100		100		100

* Specify monetary unit E.C. $

** Fiscal year -

Sources: Water Division, Public Works and Communications.

Comment: Information seems to be grossly underestimated, but was all that was available.

TABLE II-D-17

expenditures. Administrative expenses, as a portion of total expenditure on health, average 6.2% in Dominica, 13.2% in Grenada, 6.3% in Montserrat, and 1.8% in St. Vincent, showing a diverse level of expenditures for support services.[4] Personnel expenditures as a portion of total current expenditures range from under 50% in Montserrat to 64% in Dominica.[5] This indicates that fairly high percentages of the total health budgets is consumed in personnel expenditures. Capital investment on the other hand represents for Grenada, Montserrat, St. Vincent and Dominica an average of only 3.2% of the total MOH budget for the years indicated. Whether past capital expenditures are being amortized in these figures or this represents new capital expenditures in a one year period is unclear.

For the central water authorities (CWA) capital investment averages almost 60% of those budgets.[6] while personnel costs average only 18.3%. Thus, while MOH systems are seen as highly labor intensive, the CWA is seen as highly capital intensive.

With regard to the source of national funding by far, the greatest percentage of funds for the health ministries comes from

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[4] Ministry of Health figures excluding Central Water Authorities.

[5] Ibid.

[6] St. Vincent, Grenada and Dominica.

the Government's General Funds. On average (for reporting countries Dominica, Grenada and St. Vincent) over 95% of the MOH fiscal budget is derived from either transfer from Central Government funds or General Income. The remainder is derived from payments for goods and services or grants in aid. A much greater diversity in funding sources is seen in the CWA budget. In St. Vincent 37.4% of the CWA budget was derived from collected payments.[7]

In Grenada 31% was derived from this source. Only 3.46% of the budget of the Dominica CWA was derived from assessments on the population. The remainder being derived from National Loans and Central Government funding. According to the PAHO "Summary of the Water Supply Situation in the Eastern Caribbean" insufficient charges for services rendered to the water consuming public was a widespread problem in the region due not only to inadequate metering but insufficient infrastructure to develop and collect charges. Table II-D-18 to II-D-20 shows the annual budgets by agency and percentage distribvution by source of funds for both the private and public sectors in Dominica, Grenada and St. Vincent. Table II-D-21 shows the health expenditures and revenues budget of Barbados as an example of the more developed

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[7] Ibid.

TABLE II-D-18

DOMINICA

Annual budget by agency and percentage distribution by source of funds

Year____

Agencies or institutions in the health sector*	Total budget	Percentages									
		Fiscal Budget					Foreign loans	Payments for goods and services	Contribution of companies	Contribution of beneficiaries	Gifts and grants
	Amount	General income	By special law	Transfer from central Government	Transfer from State Government	National loans					
Public subsector											
1) Ministry of Health	1,911,947			95.87				4.13			
2) Central Water Authority	472,582			47.87		48.67		3.45			
3) Central Housing Authority	266,382.83			62.00				38.00			
Private subsector											
4) Catholic Social Centre	31,937.85			-		-		-	-	-	100

Sources: 1) Actual Expenditures, National Estimates. 2) Central Water Authority.
3) Central Housing Authority. 4) Financial statement, Catholic Social Centre.

Comment: Information is reliable

TABLE II-D-19

GRENADA

Annual budget by agency and percentage distribution by source of funds

Year 1970

Agencies or institutions in the health sector*	Total budget	Percentages									
		Fiscal Budget									
	Amount	General income	By special law	Transfer from central Government	Transfer from State Government	Domestic loans	Foreign loans	Sales of goods and services	Contribution of companies	Contribution of beneficiaries	Gifts and grants
Public subsector											
Ministry of Health	1,281	95		-			-	-			5
Central Water Commission	1,081	-		1			31	31			38
Private subsector											
Family Planning Association	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a. Not available

Sources: Estimates, 1970, Grenada

Comment:

TABLE II-D-20

ST. VINCENT

Annual budget by agency and percentage distribution by source of funds

Year 1969

Agencies or institutions in the health sector*	Total budget	Percentages									
		Fiscal Budget									
	Amount	General income	By special law	Transfer from central Government	Transfer from State Government	National loans	Foreign loans	Payments for goods and services	Contribution of companies	Contribution of beneficiaries	Gifts and grants
Public subsector											
Ministry of Health	1,414,557 (1)			96.4				3.6			
Central Water Authority	208,535 (2)			62.6				37.4			
Private subsector											
Planned Parenthood Association	37,207 (3)			18.8				16.7	51.7 (4)		3.5

Currency: EC $

Sources: For Central Water Authority, official estimates, 1970, Central Water Authority.

Comment: (1) Excludes E.C. $45,000 for capital expenditures for which data not available. Information reliable.

(2) Does not include 1.1 million provided by Canadian Government.

(3) Add 74.17 for interest from savings account. Deficit 3,416.16

(4) Contributions: Oxford, England 3,091.50; IPPF 16,000

TABLE II-D-21

BARBADOS

Annual Government Expenditure on Health with percentages of total Annual Budget, 1970 - 1974

Year	Total Government Expenditure	Government Expenditure on Health		
		Amount	Percent of Total Budget	Per Capita
	$	$		$
1970 - 71	99,072,801	15,593,410	15.7	65.65
1971 - 72	114,134,012	17,613,702	15.4	74.50
1972 - 73	126,323,798	18,744,506	14.8	79.43
1973 - 74	139,454,002 (a)	27,325,741 (a)	19.6 (a)	114.57 (a)
1974 - 75	162 516,234 (b)	27,669,741 (b)	17.0 (b)	113.96 (b)

(a) Revised figures.

(b) Provisional figures.

Government Expenditure on and Revenue from Health Services by Agency, 1974 - 75

Agency	Expenditure			Revenue
	Total	Recurrent	Capital	
Total	27,669,741	26,834,741	835,000	466,885
Ministry of Health - total	27,669,741	26,834,741	835,000	466,885
Queen Elizabeth Hospital	10,820,100	10,545,100	275,000	443,519
Other	16,849,641	16,289,641	560,000	23,366
Ministry of Communications and Works	...	-	...	-

Caribbean countries. Again low revenue against expenditure is noted but both a significantly higher per capita expenditure and percent of the total budget is seen in the more developed countries.

III. DONOR ASSISTANCE IN THE HEALTH SECTOR

A. UNITED NATIONS GROUP MULTILATERAL ASSISTANCE IN THE COMMONWEALTH CARIBBEAN

By far the greatest diversity in health sponsored projects in the Commonwealth Caribbean is through the Pan American Health Organization, the World Health Organization and the United Nations Development Program. Project summaries for country and regional donor assistance are attached in Appendix E. In the following tables 1) the Program Budget; 2) Summary of Investment; and 3) Additional Advisory Services shows by country and region the monetary and personnel allocation of resources in the sector. For 1977 the total program budget expenditures for the region were $2.37 million. The proposed program budget figures for 1978 are $2.21 million; a decline of $160,000. Of those amounts communicable diseases control and other services to individuals make up about 19.7% of the total 1977 allocation ($437,163). Environmental health services made up approximately 28% of the allocated resources or $631,287. Complementary services such as nursing and laboratory services were about 4.5% of the budgeted allocations ($100,340).

The total infrastructure development portion of the budget for the area. Infrastructure development consisted of health systems (42.0% of the 1977 total allocation) and development of human resources (5.1% of the 1977 total alloation).

Of the total amounts donated in assistance in the West Indies (Eastern Caribbean) about 1/3 comes from UNDP funds; 1/6 from UNFPA, and 1/6 from PAHO Regular Budget and 1/3 WHO Regular Budget. A total of $641,589 has been allocated to the Commonwealth Caribbean sector in additional advisory services.

Although there is a wide diversity of activities in which PAHO/WHO/UNDP is involved in the Caribbean Health Sector the actual level of support is not as great as many of the development projects supported by the Banks (IDB, IBRD, CDB) although few of these are in health. The areas in which resources are being expended seem to fall broadly into the following categories

Services to Individuals

1) Communicalbe Diseases
   a) Aedes Aegypti Borne Diseases.....$114,330
   b) Malaria..... 75,560
2) MCH and Family Welfare..... 72,393
3) Nutrition..... 64,845
4) Dental Health..... 9,540
5) Mental Health..... 90,495

Sub-Total	$427,163

Environmental Health Services

1) Program Planning and General Activities.....	$124,380
2) Water Supply and Excreta Disposal.....	24,390
3) Veterinary Public Health.....	460,240
4) Quality Control of Drugs.....	22,270
Sub-Total	$631,280

Health Systems

1) Program Planning and General Activities.....	$411,657
2) General Public Health Systems.....	241,980
3) Medical Care Systems.....	14,270
4) Management Systems.....	155,360
5) Statistics and Information Syustems.....	84,585
Sub-Total	$907,852

Development of Human Resources

1) Dentistry	$ 97,610
2) Environmental Sciences	11,800
3) Nursing	74,000
4) Veterinary Medicine	3,950
Sub-Total	$187,360

Complementary Service

1) Epidemiological Surveillance	$ 25,270
2) Rehabilitation	19,770
Sub-Total	$ 45,040
GRAND-TOTAL	$ 2,198,695

BARBADOS

PROGRAM BUDGET

	PROGRAM CLASSIFICATION	1975 AMOUNT $	1975 PERCENT	1976 AMOUNT $	1976 PERCENT	1977 AMOUNT $	1977 PERCENT	1978 AMOUNT $	1978 PERCENT
I.	PROGRAM OF SERVICES	191,813	57.0	266,295	63.8	194,740	57.1	135,340	47.3
	SERVICES TO INDIVIDUALS	-	-	2,000	.5	-	-	-	-
	COMMUNICAPLE DISEASES								
0700	AEDES AEGYPTI-BORNE DISEASES	-	-	2,000	.5	-	-	-	-
	ENVIRONMENTAL HEALTH SERVICES	191,813	57.0	264,295	63.3	194,740	57.1	135,340	47.3
2000	PROGRAM PLANNING AND GENERAL ACTIVITIES	32,458	9.7	54,930	13.2	17,170	5.0	18,870	6.6
2100	WATER SUPPLY AND EXCRETA DISPOSAL	680	.2	15,740	3.8	11,120	3.3	12,540	4.4
2200	SOLID WASTES	12,900	3.8	39,600	9.5	12,850	3.8	-	-
	ANIMAL HEALTH AND VETERINARY PUBLIC HEALTH								
3300	ZOONOSES	145,775	43.3	154,025	36.8	153,600	45.0	103,930	36.3
II.	DEVELOPMENT OF THE INFRASTRUCTURE	144,383	43.0	151,165	36.2	146,225	42.9	150,855	52.7
	HEALTH SYSTEMS	144,383	43.0	140,585	33.7	135,125	39.6	139,195	48.6
9000	PROGRAM PLANNING AND GENERAL ACTIVITIES	79,171	22.3	79,240	19.0	85,525	25.1	94,815	33.1
9100	GENERAL PUBLIC HEALTH SYSTEMS	32,885	9.8	50,320	12.1	49,600	14.5	44,380	15.5
9200	MEDICAL CARE SYSTEMS	35,475	10.6	11,025	2.6	-	-	-	-
9500	MANAGEMENT SYSTEMS	852	.3	-	-	-	-	-	-
	DEVELOPMENT OF HUMAN RESOURCES	-	-	10,580	2.5	11,100	3.3	11,660	4.1
6600	DENTISTRY	-	-	10,580	2.5	11,100	3.3	11,660	4.1
	GRAND TOTAL	336,196	100.0	417,460	100.0	340,965	100.0	286,195	100.0

BELIZE

PROGRAM BUDGET

PROGRAM CLASSIFICATION		1975		1976		1977		1978	
		AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT
I.	PROGRAM OF SERVICES	272,499	85.0	57,437	49.5	42,680	38.2	48,190	41.1
	SERVICES TO INDIVIDUALS	33,108	10.3	46,435	40.3	42,680	38.2	48,190	41.1
	COMMUNICABLE DISEASES								
0200	MALARIA	28,247	8.8	37,645	32.7	29,630	26.5	30,860	26.3
1300	MATERNAL AND CHILD HEALTH AND FAMILY WELFARE	4,561	1.5	8,790	7.6	13,050	11.7	17,330	14.8
	ENVIRONMENTAL HEALTH SERVICES	239,391	74.7	6,002	5.2	-	-	-	-
2100	WATER SUPPLY AND EXCRETA DISPOSAL	239,391	74.7	6,002	5.2	-	-	-	-
II.	DEVELOPMENT OF THE INFRASTRUCTURE	48,005	15.0	62,815	54.5	69,085	61.8	69,230	58.9
	HEALTH SYSTEMS	48,005	15.0	59,015	51.2	64,785	58.0	64,330	54.7
5000	PROGRAM PLANNING AND GENERAL ACTIVITIES	28,447	8.9	44,035	38.2	42,710	38.2	44,710	38.0
5100	GENERAL PUBLIC HEALTH SYSTEMS	19,558	6.1	14,980	13.0	22,075	19.8	19,620	16.7
	DEVELOPMENT OF HUMAN RESOURCES	-	-	3,800	3.3	4,300	3.8	4,900	4.2
6400	ENVIRONMENTAL SCIENCES	-	-	3,800	3.3	4,300	3.8	4,900	4.2
	GRAND TOTAL	320,504	100.0	115,252	100.0	111,765	100.0	117,420	100.0

GRENADA

PROGRAM BUDGET

PROGRAM CLASSIFICATION	1975		1976		1977		1978	
	AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT
I. PROGRAM OF SERVICES	3,150	21.0	-	-	-	-	-	-
ENVIRONMENTAL HEALTH SERVICES	3,150	21.0	-	-	-	-	-	-
II. DEVELOPMENT OF THE INFRASTRUCTURE	11,841	79.0	33,195	100.0	23,660	100.0	23,660	100.0
HEALTH SYSTEMS	11,841	79.0	33,195	100.0	23,660	100.0	23,660	100.0
9100 GENERAL PUBLIC HEALTH SYSTEMS	1,591	10.6	23,320	70.3	23,660	100.0	23,660	100.0
9200 MEDICAL CARE SYSTEMS	10,250	68.4	9,875	29.7	-	-	-	-
GRAND TOTAL	14,991	100.0	33,195	100.0	23,660	100.0	23,660	100.0

GUYANA

PROGRAM BUDGET

PROGRAM CLASSIFICATION		1975 AMOUNT $	1975 PERCENT	1976 AMOUNT $	1976 PERCENT	1977 AMOUNT $	1977 PERCENT	1978 AMOUNT $	1978 PERCENT
	I. PROGRAM OF SERVICES	299,096	74.4	314,325	73.4	200,450	62.1	255,155	64.9
	SERVICES TO INDIVIDUALS	20,955	5.2	95,815	22.3	91,220	28.2	94,915	24.1
	COMMUNICABLE DISEASES								
3200	MALARIA	-	-	44,710	10.4	42,000	13.0	44,700	11.4
0700	AEDES AEGYPTI-BORNE DISEASES	10,300	2.5	10,000	2.3	10,000	3.1	10,000	2.5
1400	NUTRITION	-	-	33,365	7.8	29,160	9.0	30,675	7.8
1600	DENTAL HEALTH	10,955	2.7	7,740	1.8	10,060	3.1	9,540	2.4
	ENVIRONMENTAL HEALTH SERVICES	247,449	61.6	175,845	41.1	81,730	25.4	131,540	33.5
2100	WATER SUPPLY AND EXCRETA DISPOSAL	247,449	61.6	158,945	37.2	-	-	-	-
	ANIMAL HEALTH AND VETERINARY PUBLIC HEALTH								
3100	PROGRAM PLANNING AND GENERAL ACTIVITIES	-	-	16,900	3.9	81,730	25.4	131,540	33.5
	COMPLEMENTARY SERVICES	30,692	7.6	42,665	10.0	27,500	8.5	28,700	7.3
4100	NURSING	30,692	7.6	42,665	10.0	27,500	8.5	28,700	7.3
	II. DEVELOPMENT OF THE INFRASTRUCTURE	103,301	25.6	113,585	26.6	122,410	37.9	137,955	35.1
	HEALTH SYSTEMS	103,301	25.6	113,585	26.6	122,410	37.9	137,955	35.1
5000	PROGRAM PLANNING AND GENERAL ACTIVITIES	45,070	11.2	46,670	11.0	48,785	15.1	51,230	13.0
5100	GENERAL PUBLIC HEALTH SYSTEMS	25,900	6.4	32,550	7.6	37,650	11.7	49,140	12.5
5500	MANAGEMENT SYSTEMS	32,331	8.0	34,365	8.0	35,975	11.1	37,585	9.6
	GRAND TOTAL	402,397	100.0	427,910	100.0	322,860	100.0	393,110	100.0

JAMAICA

PROGRAM BUDGET

PROGRAM CLASSIFICATION		1975		1976		1977		1978	
		AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT
I.	PROGRAM OF SERVICES	261,844	61.0	404,177	70.7	420,425	72.3	371,750	60.6
	SERVICES TO INDIVIDUALS	48,816	11.3	68,225	11.9	109,790	18.9	118,285	19.3
	COMMUNICABLE DISEASES								
0700	AEDES AEGYPTI-BORNE DISEASES	2,748	.6	7,625	1.3	30,915	5.3	32,330	5.3
1500	MENTAL HEALTH	46,068	10.7	60,600	10.6	78,875	13.6	85,955	14.0
	ENVIRONMENTAL HEALTH SERVICES	173,853	40.6	305,727	53.5	296,635	51.0	233,695	38.1
2000	PROGRAM PLANNING AND GENERAL ACTIVITIES	51,417	12.0	49,650	8.7	51,825	8.9	51,205	8.3
2100	WATER SUPPLY AND EXCRETA DISPOSAL	42,628	9.9	83,000	14.5	-	-	-	-
	ANIMAL HEALTH AND VETERINARY PUBLIC HEALTH								
3100	PROGRAM PLANNING AND GENERAL ACTIVITIES	-	-	-	-	9,560	1.0	6,270	1.0
3300	ZOONOSES	79,808	18.7	157,077	27.5	223,750	38.4	153,950	25.2
3600	QUALITY CONTROL OF DRUGS	-	-	16,000	2.8	15,500	2.7	22,270	3.6
	COMPLEMENTARY SERVICES	39,175	9.1	30,225	5.3	14,000	2.4	19,770	3.2
4300	EPIDEMIOLOGICAL SURVEILLANCE	5,058	1.2	-	-	-	-	-	-
4500	REHABILITATION	34,117	7.9	30,225	5.3	14,000	2.4	19,770	3.2
II.	DEVELOPMENT OF THE INFRASTRUCTURE	167,414	39.0	167,940	29.3	161,295	27.7	241,765	39.4
	HEALTH SYSTEMS	140,608	32.7	156,355	27.2	156,795	26.9	234,865	38.3
5000	PROGRAM PLANNING AND GENERAL ACTIVITIES	74,510	17.4	73,940	12.9	85,440	14.6	116,770	19.1
5100	GENERAL PUBLIC HEALTH SYSTEMS	10,769	2.5	-	-	5,560	1.0	12,540	2.0
5200	MEDICAL CARE SYSTEMS	-	-	19,140	3.3	12,560	2.2	14,270	2.3
5400	STATISTICS AND INFORMATION SYSTEMS	23,374	5.4	21,910	3.8	10,500	1.8	25,830	4.2
5500	MANAGEMENT SYSTEMS	31,955	7.4	41,365	7.2	42,535	7.3	65,455	10.7
	DEVELOPMENT OF HUMAN RESOURCES	4,606	1.1	4,870	.9	4,500	.8	6,900	1.1
6400	ENVIRONMENTAL SCIENCES	4,606	1.1	4,870	.9	4,500	.8	6,900	1.1
	PHYSICAL RESOURCES	22,200	5.2	6,715	1.2	-	-	-	-
7400	MAINTENANCE OF HEALTH CARE FACILITIES	22,200	5.2	6,715	1.2	-	-	-	-
	GRAND TOTAL	429,258	100.0	572,117	100.0	581,720	100.0	613,515	100.0

TRINIDAD AND TOBAGO

PROGRAM BUDGET

PROGRAM CLASSIFICATION		1975		1976		1977		1978	
		AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT
I.	PROGRAM OF SERVICES	83,892	22.1	192,710	26.8	177,905	34.4	136,325	32.9
	ENVIRONMENTAL HEALTH SERVICES	82,322	21.7	178,810	24.9	162,675	31.6	117,955	28.5
2000	PROGRAM PLANNING AND GENERAL ACTIVITIES	24,996	6.6	50,110	7.0	46,145	9.0	54,305	13.1
2100	WATER SUPPLY AND EXCRETA DISPOSAL	42,508	11.2	77,400	10.8	66,400	12.9	11,650	2.9
3100	ANIMAL HEALTH AND VETERINARY PUBLIC HEALTH PROGRAM PLANNING AND GENERAL ACTIVITIES	14,818	3.9	51,300	7.1	50,080	9.7	51,800	12.5
	COMPLEMENTARY SERVICES	1,570	.4	13,900	1.9	15,230	3.0	18,370	4.4
4300	EPIDEMIOLOGICAL SURVEILLANCE	1,570	.4	13,900	1.9	15,230	3.0	18,370	4.4
II.	DEVELOPMENT OF THE INFRASTRUCTURE	296,987	77.9	525,939	73.2	337,640	65.4	278,617	67.1
	HEALTH SYSTEMS	129,281	34.0	142,982	20.0	154,040	30.0	188,717	45.4
5000	PROGRAM PLANNING AND GENERAL ACTIVITIES	71,686	18.9	70,187	9.8	74,525	14.5	104,132	25.0
5100	GENERAL PUBLIC HEALTH SYSTEMS	16,670	4.4	31,640	4.4	37,430	7.3	40,400	9.7
5400	STATISTICS AND INFORMATION SYSTEMS	11,580	3.0	8,240	1.2	7,610	1.5	8,100	2.0
	DEVELOPMENT OF HUMAN RESOURCES	153,863	40.3	296,800	41.2	183,600	35.4	89,900	21.7
6500	VETERINARY MEDICINE	60,232	15.8	89,900	12.5	78,950	15.2	3,950	1.0
6600	DENTISTRY	93,631	24.5	206,900	28.7	104,700	20.2	85,950	20.7
	PHYSICAL RESOURCES	13,843	3.6	86,157	12.0	-	-	-	-
7400	MAINTENANCE OF HEALTH CARE FACILITIES	13,843	3.6	86,157	12.0	-	-	-	-
	GRAND TOTAL	380,879	100.0	718,649	100.0	515,545	100.0	414,942	100.0

WEST INDIES

PROGRAM BUDGET

PROGRAM CLASSIFICATION		1975		1976		1977		1978	
		AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT	AMOUNT $	PERCENT
I.	PROGRAM OF SERVICES	384,059	65.8	467,566	71.8	332,233	69.6	222,030	61.1
	SERVICES TO INDIVIDUALS	211,136	36.1	236,097	34.7	156,486	32.8	175,773	48.4
	COMMUNICABLE DISEASES								
0700	AFDFS AFGYPTI-RUBNF DISEASES	85,446	14.6	74,000	10.9	77,800	16.3	82,000	22.5
1300	MATERNAL AND CHILD HEALTH AND FAMILY WELFARE	90,784	15.4	127,057	18.6	42,706	8.9	55,303	15.2
1400	NUTRITION	25,497	4.3	29,750	4.4	31,886	6.7	34,170	9.4
1500	MENTAL HEALTH	9,409	1.6	5,290	.8	4,120	.9	4,540	1.3
	ENVIRONMENTAL HEALTH SERVICES	146,545	25.1	189,369	27.9	139,047	29.1	12,757	3.5
2100	WATER SUPPLY AND EXCRETA DISPOSAL	142,870	24.5	109,369	16.1	84,240	17.6	-	-
2200	SOLID WASTES	3,675	.6	-	-	-	-	-	-
3100	ANIMAL HEALTH AND VETERINARY PUBLIC HEALTH PROGRAM PLANNING AND GENERAL ACTIVITIES	-	-	80,000	11.8	54,767	11.5	12,757	3.5
	COMPLEMENTARY SERVICES	26,378	4.6	62,100	9.2	36,700	7.7	33,500	9.2
4100	NURSING	26,078	4.5	29,000	4.3	36,700	7.7	33,500	9.2
4200	LABORATORIES	300	.1	33,100	4.9	-	-	-	-
II.	DEVELOPMENT OF THE INFRASTRUCTURE	189,912	34.2	191,375	28.2	145,040	30.4	140,945	38.9
	HEALTH SYSTEMS	188,450	32.2	188,750	27.8	142,640	29.9	140,945	38.9
5100	GENERAL PUBLIC HEALTH SYSTEMS	51,547	8.8	45,510	6.7	47,940	10.0	52,240	14.4
5200	MEDICAL CARE SYSTEMS	74,421	12.7	63,895	9.4	11,175	2.3	-	-
5400	STATISTICS AND INFORMATION SYSTEMS	29,536	5.1	45,945	6.8	48,275	10.1	50,655	14.0
5500	MANAGEMENT SYSTEMS	32,946	5.6	33,400	4.9	35,600	7.5	38,050	10.5
	DEVELOPMENT OF HUMAN RESOURCES	11,462	2.0	2,625	.4	2,400	.5	-	-
6300	NURSING	11,462	2.0	2,625	.4	2,400	.5	-	-
	GRAND TOTAL	583,971	100.0	678,941	100.0	477,273	100.0	362,975	100.0

BARBADOS

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL POSTS PROF.	POSTS LOCAL	CON. MONTH	PERSONNEL AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS ACAD.	FELLOWSHIPS SHORT	FELLOWSHIPS AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	$
1975													
PAHO---PR	10,004	-	-	1	269	-	-	1	411	852	255	-	8,217
WHO---WR	97,289	1	1	-	44,913	2,699	5	-	29,178	-	1,157	-	19,342
UNDP	228,903	5	-	2	152,460	-	8	6	42,900	-	33,054	-	489
TOTAL	336,196	6	1	3	197,642	2,699	13	7	72,489	852	34,466	-	28,048
PCT. OF TOTAL	100.0				58.8	.8			21.6	.3	10.2	-	8.3
1976													
PAHO---PR	54,270	-	-	4	12,000	-	1	4	12,770	-	2,500	-	27,000
PG	6,000	-	-	2	6,000	-	-	-	-	-	-	-	-
WHO---WR	90,640	1	1	1	52,490	2,750	4	4	28,640	4,500	2,260	-	-
UNDP	266,550	5	-	-	212,650	10,350	5	3	42,450	-	627	-	473
TOTAL	417,460	6	1	7	283,140	13,100	10	11	83,860	4,500	5,387	-	27,473
PCT. OF TOTAL	100.0				67.8	3.1			20.1	1.1	1.3	-	6.6
1977													
PAHO---PR	58,290	-	-	4	14,000	-	1	4	13,790	-	500	-	30,000
WHO---WR	84,725	1	1	1	56,275	2,750	4	1	24,260	-	1,440	-	-
UNDP	197,950	4	-	2	156,800	6,150	3	-	31,500	-	-	-	3,500
TOTAL	340,965	5	1	7	227,075	8,900	8	5	69,550	-	1,940	-	33,500
PCT. OF TOTAL	100.0				66.6	2.6			20.4	-	.6	-	9.8
1978													
PAHO---PR	61,410	-	-	4	16,000	-	1	4	14,910	-	500	-	30,000
WHO---WR	99,855	1	2	1	66,065	2,750	4	2	27,860	-	3,180	-	-
UNDP	124,930	3	-	-	98,520	3,810	3	-	21,000	-	-	-	3,600
TOTAL	286,195	4	2	5	178,585	6,560	8	6	63,770	-	3,680	-	33,600
PCT. OF TOTAL	100.0				62.4	2.3			22.3	-	1.3	-	11.7

PAHO-PR-REGULAR BUDGET
PW-COMMUNITY WATER SUPPLY
PA-INCAP - REGULAR BUDGET
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PG-GRANTS AND OTHER CONTRIBUTIONS
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PAHO-PK-SPECIAL FUND FOR HEALTH PROMOTION
PS-SPECIAL FUND FOR RESEARCH
WHO--WR-REGULAR BUDGET
UNDP-UNITED NATIONS DEVELOPMENT PROGRAM
UNFPA-UNITED NATIONS FUND FOR POPULATION ACTIVITIES
WO-GRANTS AND OTHER FUNDS

BELIZE

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL: POSTS PROF.	PERSONNEL: POSTS LOCAL	PERSONNEL: CON. MONTH	PERSONNEL: AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS: ACAD.	FELLOWSHIPS: SHORT	FELLOWSHIPS: AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	$
1975													
PAHO---PR	29,047	1	-	-	24,689	2,982	-	-	-	-	576	-	800
PG	194,806	4	-	1	63,873	4,872	-	-	-	-	2,732	-	123,329
PH	44,589	-	-	-	-	-	-	-	-	-	-	-	44,589
WHO---WR	52,066	1	-	-	18,657	1,707	5	3	24,382	-	5,237	-	2,083
TOTAL	320,504	6	-	1	107,219	9,561	5	3	24,382	-	8,545	-	170,797
PCT. OF TOTAL	100.0				33.5	3.0			7.6	-	2.6	-	53.3
1976													
PAHO---PR	42,755	1	-	-	26,900	3,000	-	1	1,870	-	6,275	-	5,110
PG	6,002	-	-	-	-	1,002	-	-	-	-	-	-	5,000
WHO---WR	66,495	1	-	3	41,600	2,325	1	4	12,770	5,300	4,500	-	-
TOTAL	115,252	2	-	3	68,100	6,327	1	5	14,640	5,300	10,775	-	10,110
PCT. OF TOTAL	100.0				59.1	5.5			12.7	4.6	9.3	-	8.8
1977													
PAHO---PR	15,410	-	-	-	-	-	1	-	5,950	7,000	500	-	2,360
WHO---WR	96,355	2	-	2	66,000	5,350	1	2	9,670	9,705	5,630	-	-
TOTAL	111,765	2	-	2	66,000	5,350	2	2	15,220	16,705	6,130	-	2,360
PCT. OF TOTAL	100.0				59.1	4.8			13.6	14.9	5.5	-	2.1
1978													
PAHO---PR	19,990	-	-	-	-	-	1	-	5,830	11,000	500	-	2,660
WHO---WR	97,430	2	-	1	65,900	5,350	1	1	8,100	12,420	5,660	-	-
TOTAL	117,420	2	-	1	65,900	5,350	2	1	13,930	23,420	6,160	-	2,660
PCT. OF TOTAL	100.0				56.1	4.6			11.9	19.9	5.2	-	2.3

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PS-SPECIAL FUND FOR RESEARCH
WHO---WR-REGULAR BUDGET
UNDP-UNITED NATIONS DEVELOPMENT PROGRAM
UNFPA-UNITED NATIONS FUND FOR POPULATION ACTIVITIES
WO-GRANTS AND OTHER FUNDS

GRENADA

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL: POSTS PROF.	PERSONNEL: POSTS LOCAL	PERSONNEL: CON. MONTH	PERSONNEL: AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS: ACAD.	FELLOWSHIPS: SHORT	FELLOWSHIPS: AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	$
1975													
PAHO---PR	1,591	-	-	-	-	-	-	-	-	-	1,591	-	-
UNDP	13,400	1	-	-	5,000	-	-	1	8,400	-	-	-	-
TOTAL	14,991	1	-	-	5,000	-	-	1	8,400	-	1,591	-	-
PCT. OF TOTAL	100.0				33.4	-			56.0	-	10.6	-	-
1976													
PAHO---PR	23,320	-	-	3	9,000	-	2	2	14,320	-	-	-	-
UNDP	9,879	1	-	-	9,500	375	-	-	-	-	-	-	-
TOTAL	33,199	1	-	3	18,500	375	2	2	14,320	-	-	-	-
PCT. OF TOTAL	100.0				55.9	1.1			43.1	-	-	-	-
1977													
PAHO---PP	23,660	-	-	3	10,500	-	2	1	13,160	-	-	-	-
TOTAL	23,660	-	-	3	10,500	-	2	1	13,160	-	-	-	-
PCT. OF TOTAL	100.0				44.4	-			55.6	-	-	-	-
1978													
PAHO---PR	23,660	-	-	3	12,000	-	2	-	11,660	-	-	-	-
TOTAL	23,660	-	-	3	12,000	-	2	-	11,660	-	-	-	-
PCT. OF TOTAL	100.0				50.7	-			49.3	-	-	-	-

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UNFPA-UNITED NATIONS FUND FOR POPULATION ACTIVITIES
WO-GRANTS AND OTHER FUNDS

GUYANA

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL POSTS PROF.	POSTS LOCAL	CON. MONTH	AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS ACAD.	SHORT	AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	$
1975													
PAHO---PR	97,806	3	1	2	59,299	1,573	3	-	22,258	-	10,081	-	2,595
WHO---WR	52,137	1	-	-	31,627	1,369	1	-	9,000	562	1,555	-	7,224
UNDP	252,454	2	-	4	78,411	-	2	9	19,855	-	13,285	-	140,903
TOTAL	402,397	6	1	6	169,337	4,942	6	9	51,113	962	25,321	-	150,722
PCT. OF TOTAL	100.0				42.1	1.2			12.7	.2	6.3	-	37.5
1976													
PAHO---PR	216,475	4	1	4	146,875	13,000	4	7	34,250	-	19,200	-	7,500
WHO---WR	43,340	1	-	1	29,600	3,000	-	2	3,740	-	1,000	-	-
UNDP	167,745	-	-	-	260	-	1	-	12,450	-	846	-	153,989
TOTAL	427,910	5	1	5	182,739	16,000	5	9	50,640	-	17,046	-	161,489
PCT. OF TOTAL	100.0				42.7	3.8			11.8	-	4.0	-	37.7
1977													
PAHO---PR	105,355	1	-	5	50,475	3,000	4	8	38,680	-	13,200	-	-
WHO---WR	137,505	4	1	2	128,785	13,600	-	2	4,120	-	3,000	-	8,000
UNDP	60,000	2	-	-	57,000	3,000	-	-	-	-	-	-	-
TOTAL	322,860	7	1	7	236,260	19,600	4	10	42,800	-	16,200	-	8,000
PCT. OF TOTAL	100.0				73.2	6.1			13.2	-	5.0	-	2.5
1978													
PAHO---PR	108,765	1	-	4	50,585	3,000	4	8	41,480	-	13,200	-	-
WHO---WR	144,845	4	1	1	131,830	14,705	-	3	4,810	-	3,000	-	8,500
UNDP	120,000	2	-	3	106,400	3,600	1	-	10,000	-	-	-	-
TOTAL	393,110	7	1	8	288,815	21,305	5	11	56,290	-	16,200	-	8,500
PCT. OF TOTAL	100.0				73.5	5.4			14.8	-	4.1	-	2.2

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UNDP-UNITED NATIONS DEVELOPMENT PROGRAM
UNFPA-UNITED NATIONS FUND FOR PUPULATION ACTIVITIES
WO-GRANTS AND OTHER FUNDS

JAMAICA

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL POSTS PROF.	POSTS LOCAL	CON. MONTH	AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS ACAD.	SHORT	AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	
1975													
PAHO---PR	195,638	4	1	4	128,849	8,661	3	3	16,222	-	1,504	-	-
PW	40,580	1	-	6	38,477	297	-	-	-	-	1,804	-	-
WHO---WR	191,032	3	-	-	95,712	3,904	-	-	2,048	5,873	7,050	-	16,44
UNDP	102,009	3	-	-	90,000	-	7	-	10,350	-	624	-	3
TOTAL	429,258	11	1	12	353,038	12,862	10	3	28,620	5,873	11,386	-	17, 7
PCT. OF TOTAL	100.0				82.3	3.0			6.7	1.3	2.6	-	4.1
1976													
PAHO---PR	200,595	6	1	4	170,155	10,700	-	2	3,740	-	-.	16,000	-
PW	83,000	1	-	10	49,000	3,000	-	6	11,000	-	-	-	-
WHO---WR	124,730	3	-	1	98,335	6,775	-	1	1,870	-	-	-	17,80
UNDP	163,792	2	-	7	136,800	5,400	7	10	21,150	-	202	-	4
TOTAL	572,117	12	1	17	474,290	25,825	7	19	37,760	-	202	16,000	18 4
PCT. OF TOTAL	100.0				82.9	4.5			6.6	-	-	2.8	3.2
1977													
PAHO---PR	211,050	4	2	7	178,280	10,900	1	2	9,670	-	200	12,000	-
WHO---WR	146,920	2	-	9	117,500	5,500	-	2	4,120	-	1,000	-	18,80
UNDP	723,750	4	-	-	182,400	7,200	6	-	28,250	-	3,500	-	2,40
TOTAL	581,720	10	2	16	478,180	23,600	7	4	42,040	-	4,700	12,000	21
PCT. OF TOTAL	100.0				82.2	4.1			7.2	-	.8	2.1	3.6
1978													
PAHO---PR	270,520	4	2	15	225,340	11,900	2	6	25,280	-	-	8,000	
WHO---WR	189,045	3	-	9	150,065	5,500	-	5	11,250	-	2,130	-	20,00
UNDP	153,950	3	-	-	136,800	5,400	1	-	10,250	-	-	-	1,50
TOTAL	613,515	10	2	24	512,205	22,800	3	11	46,880	-	2,130	8,000	21,
PCT. OF TOTAL	100.0				83.5	3.7			7.7	-	.3	1.3	3

PAHO-PR-REGULAR BUDGET
PW-COMMUNITY WATER SUPPLY
PA-INCAP - REGULAR BUDGET
PH-INCAP - GRANTS AND OTHER CONTRIBUTIONS
PG-GRANTS AND OTHER CONTRIBUTIONS
PH-PAN AMERICAN HEALTH AND EDUCATION FOUNDATION
PAHO-PK-SPECIAL FUND FOR HEALTH PROMOTION
PS-SPECIAL FUND FOR RESEARCH
WHO--WR-REGULAR BUDGET
UNDP-UNITED NATIONS DEVELOPMENT PROGRAM
UNFPA-UNITED NATIONS FUND FOR POPULATION ACTIVITIES
WO-GRANTS AND OTHER FUNDS

TRINIDAD AND TOBAGO

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL POSTS PROF.	LOCAL	CON. MONTH	AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS ACAD.	SHORT	AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	$
1975													
PAHO---PR	93,149	3	-	-	84,792	1,467	-	-	286	-	-	-	6,644
PG	13,843	-	-	10	13,843	-	-	-	-	-	-	-	-
WHO---WR	74,366	1	1	-	24,951	1,966	3	3	33,334	851	5,160	-	8,444
UNDP	199,521	6	-	4	84,300	-	-	2	5,250	-	109,750	-	221
TOTAL	380,879	10	1	14	207,846	3,053	3	5	38,870	851	114,910	-	15,309
PCT. OF TOTAL	100.0				54.6	.8			10.2	.2	30.2	-	4.0
1976													
PAHO---PR	142,907	3	-	-	112,115	6,500	1	3	10,900	-	-	-	13,392
PG	66,157	-	-	20	59,957	-	5	-	27,200	-	-	-	-
WHO---WR	113,385	1	1	4	57,355	2,300	7	10	55,730	-	-	-	-
UNDP	374,200	6	-	3	228,000	9,000	1	2	12,100	-	111,000	-	14,100
TOTAL	716,649	10	1	27	456,427	17,800	14	15	105,930	-	111,000	-	27,492
PCT. OF TOTAL	100.0				63.5	2.5			14.8	-	15.4	-	3.8
1977													
PAHO---PR	88,280	2	-	-	73,050	3,500	1	3	11,730	-	-	-	-
WHO---WR	177,265	2	2	3	135,250	5,900	6	9	51,840	-	-	-	14,245
UNDP	250,300	6	-	-	220,400	8,700	1	-	8,600	-	4,300	-	10,000
TOTAL	515,945	10	2	3	398,733	18,100	8	12	70,170	-	4,300	-	24,245
PCT. OF TOTAL	100.0				77.4	3.5			13.6	-	.8	-	4.7
1978													
PAHO---PR	98,490	2	-	-	76,520	3,500	2	3	18,470	-	-	-	-
WHO---WR	214,702	3	2	4	142,215	4,500	6	7	50,870	-	-	-	15,117
UNDP	101,750	4	-	-	99,000	3,750	-	-	-	-	-	-	3,000
TOTAL	414,942	9	2	4	313,735	13,750	8	10	69,340	-	-	-	18,117
PCT. OF TOTAL	100.0				75.6	3.3			16.7	-	-	-	4.4

PAHO-PR-REGULAR BUDGET
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UNDP-UNITED NATIONS DEVELOPMENT PROGRAM
UNFPA-UNITED NATIONS FUND FOR POPULATION ACTIVITIES
WO-GRANTS AND OTHER FUNDS

WEST INDIES

SUMMARY OF INVESTMENT

SOURCE OF FUNDS	TOTAL AMOUNT	PERSONNEL: POSTS PROF.	POSTS LOCAL	CON. MONTH	AMOUNT	DUTY TRAVEL AMOUNT	FELLOWSHIPS: ACAD.	SHORT	AMOUNT	SEMINARS AND COURSES	SUPPLIES AND EQUIPMENT	GRANTS	OTHER
	$				$	$			$	$	$	$	$
1975													
PAHO---PR	71,131	2	-	-	59,287	2,235	2	-	9,609	-	-	-	-
PM	4,241	-	-	-	-	-	-	-	-	-	-	4,241	-
WHO---WR	195,180	5	-	-	108,692	9,720	8	1	54,928	910	20,922	-	-
UNDP	227,576	5	-	9	156,700	-	7	11	56,610	449	13,568	-	249
UNFPA	89,643	-	-	1	25,235	-	-	9	18,372	4,385	35,464	-	2,687
TOTAL	583,971	12	-	10	349,914	11,963	17	21	139,219	5,744	69,954	4,241	2,936
PCT. OF TOTAL	100.0				59.9	2.1			23.8	1.0	12.0	.7	.5
1976													
PAHO---PR	40,655	1	-	-	31,365	4,000	1	-	5,290	-	-	-	-
PM	5,759	-	-	-	-	-	-	-	-	-	-	5,759	-
WHO---WR	222,240	5	-	4	147,300	20,600	6	5	41,090	-	13,250	-	-
UNDP	288,989	4	-	9	142,500	9,550	11	3	57,720	-	68,003	-	15,216
UNFPA	121,298	-	-	-	48,843	-	-	9	15,657	4,913	49,121	-	2,764
TOTAL	678,941	10	-	13	370,008	30,150	18	17	119,757	4,913	130,374	5,759	17,980
PCT. OF TOTAL	100.0				54.5	4.5			17.6	.7	19.2	.9	2.6
1977													
PAHO---PR	92,195	1	-	-	32,975	4,200	2	2	15,220	-	-	-	-
WHO---WR	229,990	5	-	4	138,800	21,350	5	4	35,990	-	13,410	-	-
UNDP	152,622	1	-	-	50,920	2,010	3	1	41,525	-	45,240	-	12,927
UNFPA	42,706	-	-	-	25,231	-	-	1	2,350	300	14,525	-	300
TOTAL	477,273	7	-	4	267,926	27,560	10	8	95,085	300	73,175	-	13,227
PCT. OF TOTAL	100.0				56.1	5.8			19.9	.1	15.3	-	2.8
1978													
PAHO---PR	95,195	1	-	-	34,585	4,410	2	2	16,200	-	-	-	-
WHO---WR	239,960	5	-	3	167,300	22,150	4	6	38,940	-	13,570	-	-
UNDP	12,757	-	-	-	-	-	-	-	-	-	4,230	-	8,527
UNFPA	55,063	-	-	-	18,629	-	-	-	-	200	35,302	-	932
TOTAL	362,975	6	-	3	220,514	26,560	6	8	53,140	200	53,102	-	9,459
PCT. OF TOTAL	100.0				60.8	7.3			14.6	.1	14.6	-	2.6

PAHO-PR-REGULAR BUDGET
PM-COMMUNITY WATER SUPPLY
PA-INCAP - REGULAR BUDGET
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PAHO-PR-SPECIAL FUND FOR HEALTH PROMOTION
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WHO--WR-REGULAR BUDGET
UNDP-UNITED NATIONS DEVELOPMENT PROGRAM
UNFPA-UNITED NATIONS FUND FOR POPULATION ACTIVITIES
WG-GRANTS AND OTHER FUNDS

BARBADOS

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA I CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
AREA I (WP/WR)	Program Planning and General Activities			30	22,768	30	23 782
	Area Representantive	0.0264	D-1				
AMR-1310(PR/WR)	Maternal and Child Health and Family Welfare			120	17,182	120	18,791
	Medical Officer	4.3700	P-4	30		30	
	Health Educator	4.3702	P-4	30		30	
	Nurse Midwife	4.3703	P-4	30		30	
	Medical Officer	4.3209	P-4	30		30	
AMR-1410 (WR)	Nutrition			30	4,286	30	4,673
	Medical Officer	4.0885	P-4				
AMR-2010 (PR)	Environmental Health Services			30	6,038	30	6,405
	Sanitary Engineer	0.0862	P-5				
AMR-3110 (WR)	Animal Health and Veterinary Public Health			30	4,741	30	5,309
	Veterinarian Seminar	4.4045	P-5				
AMR-4110 (PR)	Nursing			30	4,202	30	4,467
	Nurse	0.0887	P-4				
AMR-5210 (WR)	Medical Care Systems			30	4,741	30	5,127
	Hospital Administrator	4.3580	P-4				
AMR-5310 (PR)	Health Systems - Planning			30	4,202	30	4,467
	Health Planner	4.4034	P-4				
AMR-5410 (PR)	Statistics and Information Systems			30	4,202	30	4,467
	Statistician	0.0841	P-4				
AMR-5510 (PR)	Management Systems			30	5,278	30	5,612
	Administrative Methods Officer	0.0917	P-4				
AMR-6310 (PR)	Development of Human Resources - Nursing			30	3,557	30	3,799
	Nurse Educator	0.0604	P-3				
	Total All Programs			420	81,197	420	86 399

*The Area Consultants and Area Representatives are budgeted under the AMRO projects and Area Offices listed above. These represent additional advisory services available to the countries In this document, these services are distributed equally among the countries within the area and will be available upon request to supplement country projects

BELIZE

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA III CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
Area III (PR)	Program Planning and General Activities			50	27,086	50	28,509
	Area Representantive	0.0283	D-1				
AMR-1330 (PR)	Maternal and Child Health and Family Welfare			50	7,232	50	7,531
	Medical Officer	0.3365	P-5				
AMR-2030 (PR)	Environmental Health Services			100	15,416	100	16,107
	Sanitary Engineer	0.0849	P-4	50		50	
	Administrative Methods Officer	0.2045	P-4	50		50	
AMR-3130 (WR)	Animal Health and Veterinary Public Health			50	7,884	50	8,426
	Veterinarian	4.0853	P-4				
AMR-4130 (PR)	Nursing			150	18,196	150	19,114
	Nurse	0.0891	P-4	50		50	
	Nurse	0.4084	P-3	50		50	
	Nurse	0.3214	P-3	50		50	
	Course Costs						
AMR-4330 (PR)	Epidemiological Surveillance			50	10,164	50	10,653
	Epidemiologist	0.0861	P-5				
AMR-5230 (PR)	Medical Care Systems			50	7,752	50	8,103
	Hospital Administrator	0.0899	P-4				
AMR-5330 (PR)	Health Systems - Planning			50	6,468	50	6,734
	Health Planner	0.2031	P-4				
AMR-5430 (WR)	Statistics and Information Systems			50	7,752	50	8,285
	Statistician	4.0810	P-4				
AMR-6230 (PR)	Development of Human Resources - Medicine			50	6,468	50	6,733
	Medical Educator	0.3627	P-4				
	Total All Programs			650	114,418	650	120,195

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GRENADA

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA I CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
AREA I (WP/WR)	Program Planning and General Activities			30	22,768	30	23,782
	Area Representantive	0.0264	D-1				
AMR-1310(PR/WR)	Maternal and Child Health and Family Welfare			120	17,182	120	18,791
	Medical Officer	4.3700	P-4	30		30	
	Health Educator	4.3702	P-4	30		30	
	Nurse Midwife	4.3703	P-4	30		30	
	Medical Officer	4.3209	P-4	30		30	
AMR-1410 (WR)	Nutrition			30	4,286	30	4,673
	Medical Officer	4.0885	P-4				
AMR-2010 (PR)	Environmental Health Services			30	6,038	30	6,405
	Sanitary Engineer	0.0862	P-5				
AMR-3110 (WR)	Animal Health and Veterinary Public Health			30	4,741	30	5,309
	Veterinarian	4.4045	P-5				
	Seminar						
AMR-4110 (PR)	Nursing			30	4,202	30	4,467
	Nurse	0.0887	P-4				
AMR-5210 (WR)	Medical Care Systems			30	4,741	30	5,127
	Hospital Administrator	4.3580	P-4				
AMR-5310 (PR)	Health Systems - Planning			30	4,202	30	4,467
	Health Planner	4.4034	P-4				
AMR-5410 (PR)	Statistics and Information Systems			30	4,202	30	4,467
	Statistician	0.0841	P-4				
AMR-5510 (PR)	Management Systems			30	5,278	30	5,612
	Administrative Methods Officer	0.0917	P-4				
AMR-6310 (PR)	Development of Human Resources - Nursing			30	3,557	30	3,799
	Nurse Educator	0.0604	P-3				
	Total All Programs			420	81,197	420	86,899

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GUYANA

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA I CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
AREA I (WP/WR)	Program Planning and General Activities			30	22,768	30	23,782
	Area Representative	0.0264	D-1				
AMR-1310(PR/WR)	Maternal and Child Health and Family Welfare			120	17,182	120	18,791
	Medical Officer	4.3700	P-4	30		30	
	Health Educator	4.3702	P-4	30		30	
	Nurse Midwife	4.3703	P-4	30		30	
	Medical Officer	4.3209	P-4	30		30	
AMR-1410 (WR)	Nutrition			30	4,286	30	4,673
	Medical Officer	4.0885	P-4				
AMR-2010 (PR)	Environmental Health Services			30	6,038	30	6,405
	Sanitary Engineer	0.0862	P-5				
AMR-3110 (WR)	Animal Health and Veterinary Public Health			30	4,741	30	5,309
	Veterinarian Seminar	4.4045	P-5				
AMR-4110 (PR)	Nursing			30	4,202	30	4,467
	Nurse	0 0887	P-4				
AMR-5210 (WR)	Medical Care Systems			30	4,741	30	5,127
	Hospital Administrator	4.3580	P-4				
AMR-5310 (PR)	Health Systems - Planning			30	4,202	30	4,467
	Health Planner	4.4034	P-4				
AMR-5410 (PR)	Statistics and Information Systems			30	4,202	30	4,467
	Staciatician	0.0841	P-4				
AMR-5510 (PR)	Management Systems			30	5,278	30	5,612
	Administrative Methods Officer	0.0917	P-4				
AMR-6310 (PR)	Development of Human Resources - Nursing			30	3,557	30	3,799
	Nurse Educator	0.0604	P-3				
	Total All Programs			420	81,197	420	86 899

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JAMAICA

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA I CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
AREA I (WP/WR)	Program Planning and General Activities			30	22,768	30	23,782
	Area Representantive	0.0264	D-1				
AMR-1310(PR/WR)	Maternal and Child Health and Family Welfare			120	17,182	120	18,791
	Medical Officer	4.3700	P-4	30		30	
	Health Educator	4.3702	P-4	30		30	
	Nurse Midwife	4.3703	P-4	30		30	
	Medical Officer	4.3209	P-4	30		30	
AMR-1410 (WR)	Nutrition			30	4,286	30	4,673
	Medical Officer	4.0885	P-4				
AMR-2010 (PR)	Environmental Health Services			30	6,038	30	6,405
	Sanitary Engineer	0.0862	P-5				
AMR-3110 (WR)	Animal Health and Veterinary Public Health			30	4,741	30	5,309
	Veterinarian Seminar	4.4045	P-5				
AMR-4110 (PR)	Nursing			30	4,202	30	4,467
	Nurse	0.0887	P-4				
AMR-5210 (WR)	Medical Care Systems			30	4,741	30	5,127
	Hospital Administrator	4.3580	P-4				
AMR-5310 (PR)	Health Systems - Planning			30	4,202	30	4,467
	Health Planner	4.4034	P-4				
AMR-5410 (PR)	Statistics and Information Systems			30	4,202	30	4,467
	Statistician	0.0841	P-4				
AMR-5510 (PR)	Management Systems			30	5,278	30	5,612
	Administrative Methods Officer	0.0917	P-4				
AMR-6310 (PR)	Development of Human Resources - Nursing			30	3,557	30	3,799
	Nurse Educator	0.0674	P-3				
	Total All Programs			420	81,197	420	86,399

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TRINIDAD AND TOBAGO

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA I CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
AREA I (WP/WR)	Program Planning and General Activities			30	22,768	30	23,782
	Area Representantive	0.0264	D-1				
AMR-1310(PR/WR)	Maternal and Child Health and Family Welfare			120	17,182	120	18,791
	Medical Officer	4.3700	P-4	30		30	
	Health Educator	4.3702	P-4	30		30	
	Nurse Midwife	4.3703	P-4	30		30	
	Medical Officer	4.3209	P-4	30		30	
AMR-1410 (WR)	Nutrition			30	4,286	30	4,673
	Medical Officer	4.0885	P-4				
AMR-2010 (PR)	Environmental Health Services			30	6,038	30	6,405
	Sanitary Engineer	0.0862	P-5				
AMR-3110 (WR)	Animal Health and Veterinary Public Health			30	4,741	30	5,309
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AMR-4110 (PR)	Nursing			30	4,202	30	4,467
	Nurse	0.0887	P-4				
AMR-5210 (WR)	Medical Care Systems			30	4,741	30	5,127
	Hospital Administrator	4.3580	P-4				
AMR-5310 (PR)	Health Systems - Planning			30	4,202	30	4,467
	Health Planner	4.4034	P-4				
AMR-5410 (PR)	Statistics and Information Systems			30	4,202	30	4,467
	Statistician	0.0841	P-4				
AMR-5510 (PR)	Management Systems			30	5,278	30	5,612
	Administrative Methods Officer	0.0917	P-4				
AMR-6310 (PR)	Development of Human Resources - Nursing			30	3,557	30	3,799
	Nurse Educator	0.0604	P-3				
	Total All Programs			420	81,197	420	86,899

*The Area Consultants and Area Representatives are budgeted under the AMRO projects and Area Offices listed above. These represent additional advisory services available to the countries. In this document, these services are distributed equally among the countries within the area and will be available upon request to supplement country projects.

WEST INDIES

ADDITIONAL ADVISORY SERVICES AVAILABLE

FROM AREA I CONSULTANTS*

Project No. and Fund Reference	Program Area	Post No.	Grade	1977 Units (Days)	1977 Amount US$	1978 Units (Days)	1978 Amount US$
AREA I (WP/WR)	Program Planning and General Activities			30	22,768	30	23,782
	Area Representantive	0.0264	D-1				
AMR-1310(PR/WR)	Maternal and Child Health and Family Welfare			120	17,182	120	18,791
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	Medical Officer	4.3209	P-4	30		30	
AMR-1410 (WR)	Nutrition			30	4,286	30	4,673
	Medical Officer	4.0885	P-4				
AMR-2010 (PR)	Environmental Health Services			30	6,038	30	6,405
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	Health Planner	4.4034	P-4				
AMR-5410 (PR)	Statistics and Information Systems			30	4,202	30	4,467
	Statistician	0.0841	P-4				
AMR-5510 (PR)	Management Systems			30	5,278	30	5,612
	Administrative Methods Officer	0.0917	P-4				
AMR-6310 (PR)	Development of Human Resources - Nursing			30	3,557	30	3,799
	Nurse Educator	0.0604	P-3				
	Total All Programs			420	81,197	420	86,899

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B. INTERNATIONAL DEVELOPMENT RESEARCH CENTER

The following projects are being supported in the Caribbean by the International Development Research Centre: The codes utilized in the project description represent the administrative divisions of the IDRC. They are Agriculture, Food, and Nutrition Sciences (AFNS); Information Sciences (IS); Population and Health Sciences (PHS); Social Sciences and Human Resources. While many of these projects are not specifically health related it is sueful to see the types of supporting research being done in the region in sectors that influence health, nutrition, and population but are not health and health science specific.

BARBADOS

162. Fertility declines (Barbados)

For the University of Western Ontario, Canada, to determine the key variables, including the practice of family planning, that have resulted in a significant fertility decline in Barbados, and to allow two West Indian students to undertake the second year of a Master's program in sociology, majoring in demography, at the University of Western Ontario.

(PHS) March 1971, completed $87,100.

163. Research priorities (Caribbean)

For the University of the West Indies, to study the

economic potential of alternative crops and livestock enterprises in Barbados, as a model for agricultural development in the Caribbean.

(AFNS) July 1971, 2 1/2 years $88,774.

BELIZE

See projects 219/220.

DOMINICA

187. Pre-operational family planning (Dominica).

For the Government of Dominica, for a study of the need and desire for a family planning program and for a program outline, to be carried out through the University of the West Indies.

(PHS) April 1972, completed $19,846.

GRENADA

See projects 196/197 and 201.

GUYANA

192. Fish products (Guyana)

For the Government of Guyana, to develop means of processing and marketing various species of fish which are presently discarded during shrimp trawling operations in many parts of the Caribbean.

(AFNS) November 1973, 3 1/2 years $204.710.

193. Caribbean technology policy studies

For the Institute of Development Studies of the University of Guyana, Georgetown, and the Institute of Social and Economic Research of the University of the West Indies, Kingston, Jamaica, to study the methods by which technology has been transferred to the Commonwealth Caribbean and assess its effects, and to suggest ways of increasing the economic and social benefits.

(SSHR) May 1975, 2 years $302,549

See also projects 196/197.

JAMAICA

195. Root Crops (Caribbean)

For the University of the West Indies, Kingston, to help its Department of Biological Sciences do breeding and other research to promote greater production and use of cassava, sweet potatoes and yams.

(AFNS) February 1972, 3 1/2 years $161,430

196/97. Grain legumes (Caribbean), Phase I and II

For the University of the West Indies, Kingston, for research on pigeon pea and dry beans, for training scholarships and for coordination with other similar research in Uganda, India and countries in Latin America, adn, in a second phase, to expand the pigeon pea breeding program in Trinidad and Tobago, to do research on farming

systems with grain legumes and to develop a cowpea improvement program.

PHASE I - February 1972, 3 years, 3 months $186,425.

Phase II - 2 years $309,500.

(AFNS)

198. Family planning and population bibliography (West Indies)

For the Department of Social and Preventive Medicine, University of the West Indies, Kingston, to compile an annotated bibliography of documents relating to family planning in the West Indies since 1950.

(IS) October 1973, 18 months $11,200.

199. ICIA Catalogue

To enable the Information System Division of the International Development Research Centre (IDRC), in cooperation with the University of the West Indies, to support the publication of the Imperial College of Tropical Agriculture (ICTA) Catalogue for the benefit of selected libraries in developing countries.

(IS) August 1974, 8 months $35,000.

200. Education bibliography (West Indies)

For the University of the West Indies, Kingston, to enable its Documentation Centre in Education to make a final compilation,edit and publish the lists of documents

presently on cards, adn to distribute the bibliography to governments, organizations and agencies concerned with education in the Caribbean.

(IS) June 1975, 8 months $4,000.

201. Family planning program evaluation (West Indies)

For the University of the West Indies, Kingston, to enable its Department of Social and Preventive Medicine to evaluate family planning programs in Grenada, St. Lucia adn St. Vincent, and formulate new directions for these programs.

(PHS) February 1974, 18 months $77,020.

TRINIDAD AND TOBAGO

217. Osmotic dehydration of bananas and mangoes

For the Unviersity of the West Indies, St. Augustine, Trinidad, to apply the results of a previous Osmotic Dehydration study (carried out by the Food Research Institute in Canada, see project 250), using freshly harvested produce in Trinidad and working in cooperation with small local industries.

(AFNS) April 1972, completed $10,800.

218. Cassava mites (Trinidad)

For the Commonwealth Institute of Biological Control Station in Trinidad, to support research aimed at

developing biological controls for a cassava mite infestation in East Africa through identificationa and study of the mite's natural enemies in Trinidad and adjacent areas.

(AFNS) April 1974, 2 years $13,600.

219/220. Pasture legumes (Caribbean), Phases I and II

For the University of the West Indies, St. Agustine, Trinidad, to help its Faculty of Agriculture undertake research in Antigua, Belize and Trinidad to find the most adaptable and productive forage legume species that can blend with te commonly used gresses in the drier parts of the Commonwealth Caribbean.

(AFNS) Phase I - August 1972, 3 years $147,500

Phase II- June 1975, 2 years $197,000.

See also projects 157, 158, 195, 196/197 and 243.

C. CARIBBEAN DEVELOPMENT BANK

The Caribbena Development Bank was established in 1969 and has its headquarters in Barbados. The members elegible to borrow from the Caribbean Development Bank are Antigua, Bahamas, Barbados, Belize, British Virgin Island, Cayman Islands, Montserrat, Turks and Caicos Islands, Dominica, Grenada, Guyana, Jamaica, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent and Trinidad and Tobago. Contributing member countries include Canada, Colombia, the United Kingdom and Venezuela. The United States, among other developed countries, also has contributed funds to the institution.

The main objective of the Bank is to contribute to the harmonious economic growth and development of member countries in the Caribbean and to promote economic cooperation adn integration among them, having special regard to the needs of the less developed members of the region.

The total resources of the Caribbean Development Bank currently amount to some $192 million and through December 31, 1976, it had authorized loans totaling some $115 million

Development projects by the bank have not as yet been focused in teh ealth sector. The great majority of the loans at present have been in industrial/economic development projects. Areas in which the bank is involved include agriculture,

manufacturing, tourism, infrastructure and utilities (roads, parts, electricity), housing, and education.

While all of these activities can affect an improve health status, health sector projects as such have not been undertaken by the Bank.

D. INTER-AMERICAN DEVELOPMENT BANK

At the present time IDB is not involved to a great extent in the Commonwealth Caribbean health, population, or nutrition sector. Until January of 1977 the Bank could not involve itself in development projects in non-member countries.*

A new resolution by the governing board of the Bank now authorizes the use of IDB funds for development projects in the Commonwealth Caribbean and other non-member developing nations. Projections for future development investments by the Bank in the Caribbean indicate that funds will pass through the regional Caribbean Development Bank as an intermediary in the loan process.

Current projects in the more developed Commonwealth Caribbean include the following:

Barbados - A current study is being made by a private consulting firm in the form of a technical cooperation project for the development of a National Health Insurance or National Health Service plan for the island.

Jamaica - Two water supply projects were funded by IDB in

* Only Barbados, Trinidad and Tobago, and Jamaica are IDB members. Guyana was admitted as the 34th IDB member in June, 1976.

1975. The first is a project improving urban water systems in Montego Bay and Falmouth. The second project linked to the first is a technical cooperation study leading to the selection of an appropriate entity to adminster, operate and maintain the water systems. The first project was for $12 million and the second for $65,000.

Trinidad and Tobago - IDB's involvement in health related projects in Trinidad and Tobago are involvement in financing: 1) the construction of health clinics and 2) sanitation projects totaling $12.9 million.

CARIBBEAN DEVELOPMENT BANK

The Caribbean Development Bank was established in 1969 and has its headquarters in Barbados. The members elegible to borrow from the Caribbean Development Bank are Antigua, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos Islands, Dominica, Grenada, Guyana, Jamaica, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent and Trinidad and Tobago. Contributing member countries include Canada, Colombia, the United Kingdom and Venezuela. The United States, among other developed countries, also has contributed funds to the institution

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APPENDICES

APPENDIX A. : MAGNITUDE OF HEALTH PROBLEMS

1. NUTRITION STATUS

Unlike many of the other areas included in this study, the information sources by country for nutritional information were relatively plentiful for the larger island groups although again, practically non-existent for the smaller islands. Because of this it is useful in this section to examine each of these areas separately and then blend them into a regional picture. This will serve two functions; first it will give the reader a feeling for the diversity of the island populations covered under the Commonwealth Caribbean umbrella and second it will give a broad feeling for the commonality of the island groups nutrition problems and by extrapolation to other health problems encountered in the Caribbean region.

Extended treatments of the nutrition situation in Barbados and Guyana are examined in the PAHO National Food and Nutrition Surveys dated 1972 and 1976 respectively for those areas. The Jacques May Series on the Ecology of Malnutrition Volume 12 deals with the entire Caribbean region including Cuba and Puerto Rico as well as the Spanish and French Caribbean Islands. It is from this volume that much of the information here is taken. The Caribbean Food and Nutrition Institute is an excellent source and also has

done some background work in food and nutrition policy on a regional level.

Jamaica

As one of the most developed of the developing Commonwealth polities Jamaica serves, to a certain extent, as foreshadowing of what problems and solutions may arise in dealing with health and nutrition problems in that region. Six major climatic and social problem areas have been identified by Jacques May in relation to nutrition and food production in Jamaica:

1) erratic distribution of water and good soil;
2) excessive population growth in relation to the carrying capacity of the land;
3) disaffection of rural laborers needed to make the land productive and to fight erosion;
4) unemployment in the crowded cities because of an excess of unskilled workers and a shortage of skilled ones;
5) lack of investment capital to remedy the situation; and,
6) a system of education that has not been oriented to the specific needs of the island[1]

These problems are not uncommon to most developing nations but are compounded in Jamaica by various social, geographic, and economic problems that have been alluded to

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[1] May, Jacques M. and McLellan, Donna L., The Ecology of Malnutriti in the Caribbean, Volume 12, p. 126.

in other chapters of this study. Among these are 1) the social custom allowing all "family" members to obtain and consume food whether or not they have worked to produce the food; 2) the social structure inhibits family planning efforts and makes the scarce food resources even more scarce; 3) the tourism factor is a mixed blessing in that it acounts for $100 million per year income but also prices food beyond the typical family's ability to afford it; 4) the physical geography of the island does not facilitate inland communications; 5) as a result of the former slave labor social structure a large majority of the land borders large estates and is small in size which cannot support the inhabitants without outside cash wages or substanital government support.

Despite this long list of liabilities in May's estimation the Government is aware of the existence of these problems and is attempting to steer a middle course between excessive dependence on tourism and excessively strict limitations against it. In May's opinion the ideal would be to promote local food production to the point where it would be attractive to tourists yet priced sufficiently low for

local budgets.[2]

Diets

As might be expected the Jamaican diets are low in animal protein and high in carbohydrates due to limited production of domestic protein and the high price of imported protein. The basic foods consumed by the population are rice, roots, coconut products, plantains, and tropical fruits (in increasing quantities). While meat and fish are consumed it is not available in adequate amounts to fulfill protein requirements. Other than the above comments regarding the need to supplement subsistence farming with wages and the resulting part-time availability of family members to work their own land, two factors contribute to the malnutrition problems. The first are poor transportation over bad roads and the second is the fragility of the family pattern which forces unwed mothers to leave their infants with relatives in order to work.

Levels of Nutrition

The nutritional status of the population varies according to the community. A 1968 study (Ashworth) indicated a very low caloric intake in some Jamaican rural

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[2] Ibid., p. 127.

communities thus implying the existence of pockets of rural malnutrition. The estimated overall daily caloric intake for the entire population according to Jacques May averaged 2,600 calories per day per capita. The outcome of the 1968 Ashworth study makes these figures somewhat suspect. Carbohydrates provide an average of 76.4 per cent of the daily caloric intake with 11 per cent from fats and 12.6 per cent from proteins. The indication is that the more recent figures have changed for the worse. Further, the pockets of malnutrition indicate both faulty food distribution patterns and a lack of general nutrition education.

Those who benefit from the increased tourist trade and economic upswing clearly do not reside in these malnutrition areas. While figures may point to increased demand for milk, cheese,and butter this may be due in part to an overall increse of 107 percent in the tourist trade during the same period demand was measured, and not to increased demand by the malnourished inhabitants.

The diets for children are singularly the most defective in the population. Children overall obtained less than 63 percent of their protein and energy requirements with older children (3 to 6 years) at 80% and weaning tots to 1 year old receiving 55% of requirements. The length of

breast feeding is approximately 5 to 8 months.

The foods consumed (see 1) provide calcium intake of 500-600 milligrams which is low but acceptable (if absorbed), iron intake of 20 milligrams per day which is ample, phosphorus intake of 1 gram which is sufficient and Vitamin A intake which is ample as are thiamine, riboflavin, and niacin levels. The daily averages appear to be fairly sufficient but the figures are again suspect due to the pockets of malnutrition discovered by further research efforts. The figures shown are gross national figures and must be disaggregated by income levels to gain a clearer insight into the true nutritional problems.

Nutritional Disease Patterns

A 1964 study by Ashcroft and Lovell found improvement in heights and weights among Jamaican male and female low socioeconomic status school children in two separate trials. This indicates an overall trend towards improving standards of living. Similar studies indicate that this living standard progress is increasing more rapidly in urban areas than in rural areas over the same period of time. Another study indicates that 70 of 204 (34%) children who died between the ages of 6 months and three years were as a result of malnutrition (132 of the 204 (64%) cases had

TABLE I

Food Balance Sheet – Jamaica, 1964 (Estimated)
(Population 2,000,000 approximately)

Product	Supply					Utilization									
						Nonfood use				Supply for food					
												Net			
												Per capita			
	Production	Imports	Exports	Changes in stocks	Total supply	Seed and waste	Feed	Industrial	Total	Total gross	Extraction rate	Total	Per year	Per day		
	1,000 m tons	1,000 m tons	1,000 m tons	1,000 m tons	1,000 m tons	1 000 m tons	1,000 m tons	1,000 m tons	1 000 m tons	1 000 m tons	Percent	1 000 m tons	Kilograms	Calories	Grams protein	Grams fat
Flour	–	121	–	–	121	–	–	–	–	121	–	121	64 0	638	22 3	1 9
Corn	4	18	–	–	22	–	4	–	4	18	95	17	9 2	91	2 3	1 0
Rice	4	45	–	–	49	1	–	–	1	48	60	29	15 2	150	2 8	3
Other cereal prod	–	5	–	–	5	–	–	–	–	5	–	5	2 5	26	6	1
Total cereals					197								90 9	905	28 0	3 3
Sugar*																
Raw	510	–	429	–	81	–	–	–	–	81	–	81	43 0	412	1 2	–
Potatoes	12	6	–	–	18	3	–	–	3	15	–	15	8 0	15	4	–
Sweet potatoes	101	–	–	–	101	3	–	–	3	98	–	98	52 0	130	2 8	3
Cassava	13	–	–	–	13	–	–	4	4	9	–	9	4 7	14	1	–
Pulses	6	4	–	–	8	–	–	–	–	8	–	8	4 2	44	2 8	3
Coconuts	17	–	–	–	77	–	–	43	43	34	–	34	18 0	70	9	6 7
Other vegetables	104	–	–	–	104	5	–	5	10	94	–	94	49 8	40	1 6	3
Bananas	271	–	171	–	100	12	–	–	12	82	–	82	43 5	81	1 1	4
Other fruit	459	–	–	–	459	35	46	–	81	378	–	378	200 2	262	4 7	3 3
Cacao	2	–	–	–	2	–	–	–	–	2	88 5	2	1 3	13	3	9
Beef and veal	20	3	–	–	23	–	–	–	–	23	–	23	12 0	51	5 1	3 3
Other meat	18	–	–	–	18	–	–	–	–	18		18	9 5	67	3 2	6 0
Total meat													21 5	118	8 3	9 3
Fish	13	32	–	–	45	–	–	–	–	45		45	23 9	41	5 8	1 6
Vegetable oils	16	–	–	–	16	–	–	–	–	16	–	16	8 5	206	–	23 3
Slaughter fats	4	–	–	–	4	–	–	–	–	4	–	4	2 2	51	1	5 6
Butter	4	3	–	–	3	–	–	–	–	3	–	3	1 5	29	–	3 3
Total fats													12 2	286	1	32 2
Whole milk	75	–	–	–	73	2	16	38	56	17	–	17	9 2	15	8	8
Dried milk	–	7	–	–	7	–	–	2	2	5	–	5	2 8	28	2 8	1
Canned milk	20	–	–	–	20	–		–	–	20	–	20	10 4	91	2 3	2 4
Cheese	–	1	–	–	1	–	–	–	–	1	–	1	7	7	7	4
Total milk and cheese														141	6 6	3 7
Eggs	15	–	–	–	15	2	–	–	2	13	–	13	6 8	27	2 0	1 9
Total consumption														2559	60 7	64 4

Source: U S Department of Agriculture (Economic Research Service), *Food Balance Sheets for 24 Countries of the Western Hemisphere Projected 1970*

malnutrition as a contributing factor). The composite of this data seems to indicate that children who survive the early dangers of malnutrition develop within normal limits. Generalization from this composite must be cautiously approached, however, in that poverty and rural pockets are conducive to serious levels of malnutrition as discussed above.

The occurence of nutritional diseases in certain groups is commonplace. As indicated above protein calorie malnutrition (PCM) among children is most severe between the ages of 0-3 years. Typical Kwashiorkor is becoming rarer. PCM is estimated to be evident in 35,000 to 50,000 infants. Anemia is also prevalent in Jamaica especially among young children. Despite declining infant mortality rates malnutrition still plays a major role in contributing to death through lowered resistance to infection and disease.[3]

Barbados

As is the case with most of the smaller Caribbean islands the food resources for self-support are inadequate in Barbados because the majority of the arable land is

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[3] Ibid., p. 126.

utilized in the cash crop production of sugar. Of the total 26,360 hectares of arable land 24,000 hectares is utilized in sugar production. This allows only 2,360 hectares for the production of food crops to feed a population in excess of a quarter of million. A 1969 CFNI study showed that only 12 percent of the surveyed families grew any part of the food they consumed. As might be expected with a low average income population ($300 per year) an average of more than 50% of that income is spent on food. The median is 64% of the yearly income.

Diet and Level of Nutrition

The general Caribbean diet is typified by Barbadians and is based on imported salted codfish, locally grown pulses, and imported rice and fruit. Of the daily per capita expenditure animal proteins represented 50%, cereals 15.7%, sugars, fruits, and pulses 3%. Amazingly, soft drinks reached an average of 10% of the daily expenditure!

Unlike much of the rest of the developing world Barbados has food available (mostly imported), its cost is not exorbinant, and there appear to be no distribution problems. Unfortunately, despite these assets the nutritional requirements are not being met.

CFNI studies in 1969 indicate that the average daily

caloric intake per capita was 2,334 calories and 64.4 grams of protein were utilized. Of these 2,334 calories, 39.8% were cereal, 17% sugar, fats 10.9%, meat and fish 10.7%, milk and milk products 6.5%. Protein sources follow roughly the same distribution patterns. Similarly to other developing nations the Barbadian population prefers imported fruits and vegetables (canned) to the excellent and abundant tropical fruit grown locally.

CFNI reports indicate that only 46% of the infants studied were meeting daily calorie intake. For all the groups sampled on the island, however, the average levels of nutrition were nearly adequate or better in five of the most important nutrients: protein, calcium, iron, Vitamin A, and thiamine. Overall the caloric intake was low as was the levels of riboflavin and vitamin C.

As might be expected nutrition levels varied according to district, with the wealthy Christ Church district having the best dietary intake and the most rural and poorest parishes (St. Andrews and St. Philip) were least satisfactory especially in terms of calories, calcium, thiamine, riboflavin, vitamin C and niacin. Table II illustrates these differences according to area. Looking at this from another viewpoint the wide disparaties in

TABLE II

BARBADOS

Families Meeting Their Caloric and Nutrient Requirements – 1969
(In Percent by Parish)

Nutrient	Christ Church	St Philip	St. Michael	St. Andrew	St Joseph	Average
Calories	49 3	38.9	33.3	23 8	40 0	35 2
Protein	78 9	61 1	62.1	47 6	53 3	61 1
Calcium	73.7	27 8	42 2	19.0	46 6	41 7
Iron	47 3	33.3	40 9	42 5	26 6	39 5
Vitamin A	68 4	72.2	71 2	33.3	60.0	64 0
Thiamine	52.6	33.3	39 3	28.6	53 3	40 3
Riboflavin	42.1	16.7	22.7	4 7	20 0	21 6
Niacin	21.0	16.7	13.6	9.5	6.7	13.7
Vitamin C	47.3	38 9	37.8	4 7	33 3	33 8

Source Caribbean Food and Nutrition Institute, *Barbados Nutrition Survey*

TABLE III
BARBADOS

Maximum and Minimum Percent Satisfaction of Caloric and Nutrient Requirements Among Households on a Per Day Per Capita Basis - Barbados 1969

Nutrients	Maximum	Minimum
Calories	429	33
Protein	423	33
Calcium	477	16
Iron	525	21
Vitamin A	537	8
Thiamine	451	27
Riboflavin	259	16
Niacin	334	23
Ascorbic Acid	429	3

Source. Caribbean Food and Nutrition Institute, *Barbados Nutrition Survey*

nutritional levels can be seen from the maximum and minimum percentage of nutritional fulfillment indicated in Table 3. Further study of protein consumption demonstrated that at least 12 per cent of the families in St. Michael (where Bridgetown is located) and 28 per cent of the families in St. Philip received less than ten percent of the needed amount of quality protein.

To summarize the preceding disparities in nutritional levels, one must be cautious of speaking of average nutritional intakes. The average intake both of calories and nutrients reached 100 per cent or more of the requirements but only 64% of the families investigated consumed adequate levls of Vitamin A and only 40% consumed the necessary levels of calcium, iron, and thiamine. Further, only 33% received adequate Vitamin C, 22% adequate riboflavin and 14% adequate niacin. The worst deficiencies are seen in rural, low-income populations and among infants, mothers and small children. This means that at least 1/3 of the households investigated lacked sufficient quality and quantity of calories and nutritients. Jacques May seems to feel that this situation could be ameliorated by proper education as quality foods already exist on the island (especially pulses, fish and fruit) and greater quantity

could be secured and distributed adequately.[3]

Nutritional Disease Patterns

CFNI surveyors found that under-nutrition rather than malnutrition is the chief disease pattern identified in Barbados. Neither protein-calorie malnutrition nor rickets were found to be significant pathological conditions among children. One-third of all school children were moderately underweight. It is important to recognize that the sample was limited to children in school which comprised only 64% of the school-age population in 1970 and only 58% in 1960. Among adult females a high percentage suffered from overweight and obesity.

Among prevalent nutritional disorders, anemia was found in 33% of pre-school children, 9% of school aged children, 19% of adult women and only 1% of adult males. Such anemia may be due to iron and folate deficiencies as hookworm does not occur with great frequency in Barbados. Peridontal disease is prevalent with only 3 of 411 children between 10 and 15 years surveyed showing complete dentition. With few qualified dentists available proper preventive and curative dental services are quite deficient.

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[3] Ibid., p. 332.

Trinidad and Tobago

Trinidad and Tobago have had the benefit of sugar production, oil reserves, and a tourist trade to balance against many of the liabilities one might expect to occur in most developing nations. The difficulty from the nutritional standpoint is not lack of available funds to purchase food from abroad to supplement diets but rather the mass urban migration trend and the lack of a work force who find manual labor a desirable or suitable calling.

As was seen in Jamaica the inadequate size of rural holdings necessitates outside income to support a subsistence lifestyle. Further, the attractiveness of city life and disaffection to village life make mass migration a serious problem. The towns have difficulty absorbing the immigrants, insufficient employment in the factories leads to shantytown existence with the concommitant health and nutritional difficulties associated with such living conditions.

Diets

Two nutritional studies made in 1961 and 1970 respectively by the U.S. Interdepartmental Committee on Nutrition for National Defense (ICNND) and CFNI provide a

good progress report on the nutritional status of Trinidad and Tobago. The average monthly family income was found to be $70 in Trinidad and $63 in Tobago in the 1960 survey with the cost of food representing 61% of that income. By 1970 the average family income was $149 and the cost of food represented 55.3% of the income, a 6% decline.

It is difficult to generalize about the nutritional or health status of the population in Trinidad and Tobago because of the varied ethnicities represented. While all groups consumed rice, for example, the Hindu population consumed significantly more than the Moslem or African population. The African population ate more bread than the rest of the population combined. Hindus ate legumes which provide good vegetable protein not consumed in quantity by the remainder of the population. The African population consumed as much meat as they could afford while the Hindus consumed little or none. The Moslems ate some beef and mutton but no pork. Thus it becomes apparent that any generalities made about nutritional levels or diets must be considered in light of the ethnic backgrounds of the population.

According to the 1970 survey most of the East Indians are rural and most of the Africans were urban. This, of

course, affected the nutritional consumption patterns. A positive aspect of the survey indicated that increased rural (East Indian) vegetable consumption signaled increased availability. This may be due to decreasing exports which promotes domestic consumption.

Another factor which was stressed in the 1970 survey was the improvement in both income and diets in the cities which indicates a higher income population due to the oil production industry. Again one might be cautious in assuming "average" income and diet figures as this does not reflect the status of the large lower class mentioned earlier. One factor, however, that must be considered is that the weighted average consumption of vegetables, meat, fish, eggs, and milk decreased as the household size increased. The effect then, of larger families on diet quality is apparent.

On the whole over the 9 year period the amount of cereals consumed remained fairly constant while legume and vegetable and fruit consumption increased at a greater rate than the population growth. The average diet seems to have improved but significant portions of the population were still found to be under-and malnourished.

Levels of Nutrition

According to the 1970 CFNI survey 16% of the surveyed households received less than the recommended 2,000 calories per day (per capita) while 41% received more than 3,000 calories. The amount of protein consumed appeared adequate but the quality was low. The protein/calorie ratio was inadequate at all surveyed locations and the animal to total protein ratio was low. Milk provided the main source of calcium; vegetables and milk provided Vitamin A; milk and cereals-riboflavin; and meat and cereals contributed the niacin.

As discussed above, however, averages have very little meaning in attempting to define the percentages of households with deficient nutrients. They do not reveal areas (such as the shantytown suburban locations) which are pockets of malnutrition. In Narvia, Victoria and St. Patrick, for example, 61 percent of the households did not meet their caloric requirements and 31% failed to meet protein requirements. Among this same group 22% and 25% were deficient in calicium and iron; 29% and 12% were low in vitamins A and C; 33-47% were deficient in thiamine; 51% in riboflavin, and 44% in niacin.

Both the 1961 and 1970 surveys indicate that despite adequate and varied food resources the various populations

demonstrate an uneven and often insufficient nutritional status. The 1961 survey showed that the daily average caloric intake was 83.6% of the requirements. This dropped in surveyed suburban areas to 72% of the requirements. The 1970 survey showed that only 57% of all households surveyed met their caloric requirements.

Within this survey several groups, notably children, were significantly lower in nutritional levels. Much of the difficulty appears to be the result of ethnic and cultural traditions as well as income levels and employment opportunities. Due to increased economic opportunity part of the population has moved up the income scale. This, is balanced by the resultant "shanty town" suburban living conditions and children with working mothers which has probably resulted in increased infant malnutrition.

Nutritional Disease Patterns

Nutritional status in Trinidad and Tobago is often difficult to measure due to the varied racial situation. Typically the height and weight comparison finds Africans heavier than the mixed population who in turn are larger than the East Indians. Very few people (including children) were found to be less than 70% of standard which measure is considered within a normal range. Of some interest is large

numbers of individuals who range in the 120 percent category (obese). One conclusion that may be drawn from this variance is the highly diverse levels of the population, indicating pockets of malnutrition and ensuing nutritional diseases.

Among the prevalent nutritional diseases are vitamin B complex deficiencies, inadequate iodine levels, and protein-caloric deficiencies. The most obvious symptoms of these deficiencies were found in Port of Spain and were also seasonal in frequency. Swollen gums due to ascorbic acid deficiency and goiter were found with some frequency (particularly in Tobago where 19.9% of the population has goiter).

As might be expected nutritional deficiencies found in pregnant and lactating mothers were more prevalent than in the population as a whole. The incidence of diarrhea in children and steptococcal and respiratory ailments in adults indicates a synergistic action between infection and malnutrition. The cause and effect relationship is almost indistinguishable. Protein-calorie malnutrition has also been observed and numerous studies have been made in an attempt to determine interrelationship between PCM and anemia.

Dental caries is widespread although exact figures are not available. It is effected not at all by the very limited introduction of fluorine in the drinking water. Periodontal disease is also widespread although it is more prevalent in rural areas than in the cities where treatment is more readily available.

In summary then, malnutrition in Trinidad in Tobago is limited to specific pockets of the population which are identifiable. The health authorities want to eradicate the problem but are faced with the difficult and complex social and cultural backgrounds that clash and have significantly influenced the pattern of disease perhaps much more than other countries. Malnutrition in Trinidad and Tobago is preventable but will take significant effort to overcome local food habits and traditional patterns of living.

Guyana

Through the collaborative efforts of the Government of Guyana and the Caribbean Food and Nutrition Institute (CFNI) a National Food and Nutrition Survey of Guyana was conducted in the spring of 1971. The survey examined not only the nutritional status of the population, food production, and consumption patterns but placed the nutritional status of

the population in the larger environmental and socio-cultural framework proposing recommendations for action in nutrition by the GOG.

Similar to the Trinidad and Tobago population discussed earlier, the Guyanese are an ethnic composite of East Indians (50%), Africans (38%), and 11% classified as "other". Characteristically, the East Indian is rural and the African urban although there can be no clear distinction on these lines. As was seen in Trinidad and Tobago nutritional status is affected to a great extent by these socio-cultural differentiations.

The average overall income for Guyanese was $542 per capita per annum nationally with the urban incomes averaging $784 and the rural incomes $418. The most outstanding cash outflow of the population was for food at $199.30 per capita per annum. The national average was 69% of cash income spent on food. Rural populations spent a much larger proportion as might be expected (87%) and urban populations spent less than the national average (44%).

Guyana is not faced with the acute land shortage seen so often in the Caribbean. Although Guyana has an overall population density of 8.3 persons per square mile (compared with Barbados 1,440 persons/square mile level), this figure

can be quite misleading when one considers the vast expanses of all but uninhabited (perhaps uninhabitable) land in the country's interior. All but 50,000 of the 800,000 population live on the coast accounting for the 300+ person per square mile density in this area compared to the 0.9 person per square mile density in the interior. This provides a similar food production/density situation seen in the Commonwealth Caribbean as a whole. Thus while the total land area encompasses 19,671,000 hectares only 405,000 hectares are deemed arable while at the present time little more than 200,000 hectares are under permanent cultivation.

Nutritional Status of the Population

The National Food and Nutrition survey cites the complexities of determining the nutritional status of the diverse ethnic populations of Guyana given the difficulties of measuring "well-being" by anthropometric characteristics. According to the surveys, however, of the children under 5 years of age 16% are in Gomez II (definitely underweight), 1.7% are in Gomex III (very severely underweight) and 43% are in Gomez I (slightly underweight). Malnutrition is more severe in the rural areas where 22 percent more infants and children under age 5 are in Gomez grades II and III than in urban areas (7%). Compared with 6 per cent of the Africans,

25% of the East Indians fell in this category.

With regard to the older children and adults a large number of the school age rural children remain underweight while rural men are underweight but muscular. Many of the urban women are underweight but two-thirds of the urban women and half of the rural women are obese. Thus the picture is one of undernutrition in children and undernutrition and obesity in adult women. This emphasizes the problems of intrafamily distribution of available foods and of faulty food habits.[2]

Nutritional Disease Patterns

Table 4 indicates the outcome of clinical examinations done on the sample populations during the course of the Food and Nutrition Survey. It essentially indicates little severe nutritional deficiencies such as kwashiorkor or marasmic kwashiorkor. It should be noted, however, that positive clinical signs are identifiable only when all forms of adaptation and compensation to a deficient diet have collapsed. Clinical signs of PCM, for example, are much less common than are the anthropometric changes

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[2]National Food and Nutrition Survey of Guyana, p. 32-33, PAHO publication number 323.

TABLE IV

Clinical signs (urban and rural areas combined).

Percentage distribution of sample by positive clinical signs	Age (years), sex, and sample size				
	0.5-5	6-14	Over 14		
Nature of clinical signs	M + F N = 977	M + F N = 332	M N = 530	F N = 535	Preg. N = 92
Hair					
Thin and sparse	4.1	.9	.8	0.0	0.0
Proximal dyspigmentation	2.1	1.5	.2	0.0	0.0
Shaved	0.0	0.0	0.0	0.0	0.0
Eyes					
Bitot's spots	0.0	0.0	0.0	0.0	0.0
Xerosis	0.0	0.0	0.0	0.0	0.0
Keratomalacia	0.0	0.0	0.0	0.0	0.0
Bilateral central corneal scars	.4	1.2	0.0	0.0	1.1
Pale conjunctivae	27.9	24.7	21.7	29.2	27.2
Lips					
Angular stomatitis or scars	.9	1.8	.6	2.1	1.1
Cheilosis	.8	1.8	.2	1.3	2.2
Tongue					
Smooth (atrophic papillae)	.2	0.0	0.0	.2	0.0
Scarlet and raw	0.0	0.0	0.0	0.0	0.0
Gums					
Spongy and bleeding	0.0	0.0	.8	1.1	2.2
Obvious periodontal disease	0.0	0.0	1.3	2.2	1.1
Glands					
Bilateral parotid enlargement	.4	0.0	2.5	3.6	5.4
Thyroid enlargement	.1	3.0	2.8	15.1	29.3
Skin					
Pellagrous dermatitis	0.0	0.0	0.0	.2	0.0
Flaky paint shins	8.1	21.4	18.7	16.3	8.7
Bilateral edema	.2	1.8	4.2	14.8	17.4
Loss of elasticity	0.0	0.0	0.0	.3	0.0
Follicular hyperkeratosis (bilateral at elbows)	.6	6.0	2.8	5.6	3.3
Scabies (on hands and visible parts)	1.0	.9	.8	.2	0.0
Bones					
Frontal or parietal bossing	11.8	2.7	.8	0.0	0.0
Beaded ribs	1.0	1.8	.2	0.0	0.0
Harrison's sulcus	0.0	0.0	0.0	0.0	0.0
Bilateral enlarged painless wrist epiphyses	0.0	0.0	0.0	0.0	0.0
Knock-knees or bowlegs	12.3	9.9	6.6	1.9	1.1
Disease					
Kwashiorkor	0.0	0.0	0.0	0.0	0.0
Marasmic kwashiorkor	0.0	0.0	0.0	0.0	0.0
Marasmus	1.1	.3	.9	0.0	0.0
Current respiratory infection	40.9	18.7	21.7	20.0	17.4
Current alimentary infection	2.1	.9	.6	.7	1.1
Other current illness or disability	.1	0.0	1.3	.9	0.0

that occur in compensation to malnutrition.[3]

Laboratory tests indicate that high proportions of all age groups both urban and rural were anemic (particularly urban). This anemia, however, was found to be rarely severe except in pregnant women, more than half of whom are anemic. This high percentage of anemia in all age groups suggests the prevalence of intestinal parasitism which is backed up by recent laboratory results of stool specimen examination. As might be expected the anemia was more prevalent in areas where PCM was more common in pre-school children than in places where it was not.

Other noted deficiencies were found in Vitamin A (associated with the clinical symptom of follicular hyperkeratosis), iron deficiency (anemia as noted above), folic acid deficiency (also anemia) and protein deficiency (PCM levels). Correlation was found between hemoglobin levels (mean corpuscular hemoglobin concentration) and water supply, surprisingly. The more distant the water supply was from the house, the less anemia was found in the household. This association may not be causally related but might have some bearing on the intestinal parastism discussed earlier

[3] Ibid., p. 35.

and hence consideration of ecological/environmental factors especially as regards programming options.

Thus, one might conclude that 1) the nutritional status in Guyana is not severely poor but that pockets of malnutrition exists; 2) nutritional deficiencies are prevalent but preventable; and, 3) the interrelationship between environment and nutritional status is very close.

Belize

Sources of information on the nutritional status of the population of Belize are not as readily available as that on other parts of the Commonwealth Caribbean. No scientific nutrition study has been carried out to data and hence statistical concepts of disease patterns are non-existent.

The total land area of Belize amounts to approximately 2.3 million hectares of which only 72,000 hectares or 3.1% of the land area has actually been cultivated. As much as 25% of the country's food resources had to be imported in 1970.

The population of approximately 116,000 has only recently become independent and hence the development of national food and nutrition policies and plans have been quite limited. The future seems to be dependent on the

not obtainable

3-Day Diet of Creoles – British Honduras, 1967

Meal	First Day	Second Day	Third Day
Breakfast	1 cup cocoa (made with sugar, condensed milk, boiling water and cocoa) 3 johnnycakes* ½ egg	3 slices bread (buttered with margarine) Tea	1 cup tea 3–4 slices bread 1 oz cheese
Dinner	Stewed kidney beans with Pigs' tails** White rice Fried plantains	Fish White rice Fried plantains Potato pudding	Stewed beef Beans and rice Baked plantains
Supper or Tea	Leftovers from midday meal Bread and butter Tea	Johnnycakes* Tea	Leftovers from from midday meal Bread and butter Cocoa

*Made from cornmeal.

**No information is given as to who eats the rest of the pig. Some of it must be turned into lard and the best parts may be exported

Source: CARE Belize, Unpublished Report, 1967.

3-Day Diet of Black Caribs – British Honduras, 1967

Meal	First Day	Second Day	Third Day
Breakfast	Manioc bread Fish Tea	Bread Margarine Tea	Manioc bread Tea
Dinner	Plantain meal Fish stew	Boiled conch Rice Boiled plantain	Boiled fish Yams Manioc
Supper or Tea	Leftovers from midday meal	Leftovers from midday meal	Leftovers from midday meal

Source: CARE Belize, Unpublished Report, 1967.

3-Day Diet of Spanish-speaking Indians and Mestizos British Honduras, 1967

Meal	First Day	Second Day	Third Day
Breakfast	Corn tillas Fried ns	Fried egg & beans Tea Corn tortillas	Fried beans & pepper Tea Bread or tortillas
Dinner	Tam Wate Kool-Ai	Tacos* Rice	*Escabeche*** Corn tortillas
Supper or Tea	Pana Tea	*Garnarches** Tea	Enchiladas* Tea

*Dishes made chiefly with a little animal protein in the form of meat, fish or cheese added as filli

**A meat dish based o vl.

Source: CARE Belize d Report, 1967.

superior in both quantity and quality although no real assessment can be made without quantitative data.

Adequacy of Food Resources

There is no doubt from available information that food resources in Belize are inadequate. It is equally apparent that the country could more than adequately provide essential nutrition if its agricultural potential were realized. Even given the present output if adequately distributed (corn, beans, and rice), 2,019 calories per day per capita could be assured. Table 6 demonstrates the potential of such an equitable distribution pattern.

Nutritional Disease Patterns

Once again the lack of a systematic survey makes projection of incidence and prevalence of nutritionally related disease patterns difficult to accurately ascertain but the Jacques May volume has gathered the impressions of health workers with extended experience in Belize which provides at least a broad picture of the disease patterns.

In the Stann Creek area Kwashiorkor is reported to be a serious problem among Black Caribs and the disease is also reported sporadically in other regions of the country. Infantile diarrheas are common in the urban Belize City where children are fed condensed milk and unsterile water at

TABLE VI

Hypothetical Diet Based on Local Resources – British Honduras, 1971

Food	Grams pc/pd	Calories	Protein (g)	Fat (g)	Ca (mg)	Fe (mg)	Vit.A (mcg)	Thiam. (mg)	Rib. (mg)	Na. (mg)	Vit C (mg)
Rice	160	587	11.5	.9	14	2.0	0	.12	.04	2.5	0
Corn	364	1,230	29.5	20.0	32	9.3	1.8	1.30	.30	6 8	3.6
Beans	60	202	13.0	.9	51	4.5	3.0	.32	.11	1.2	1 8
Total	584	2,019	54.0	21.8	97	15.8	4.8	1.74	.45	10 5	5 4

Source: Computed from various sources.

TABLE VII

Percent Prevalence of Clinical Signs of Nutritional Deficiencies
St Kitts-Nevis Anguilla, 1961
(males and nonpregnant, nonlactating females)

Clinical Sign	Deficiency Presumed to Cause Symptom	Percent Prevalence		
		St Kitts	Nevis	Anguilla
Nasolabial seborrhea	Riboflavin	13 9	17 9	22 5
Angular lesions of the lips	Riboflavin	5 0	15 3	2 2
Angular scars of the lips	Riboflavin	16 6	25.1	13 2
Swelling of the gums	Vitamin C	0.5	0 3	0 9
Papillary atrophy of the tongue	Riboflavin and/or niacin	3 4	2 0	5 6
Enlarged thyroid	Iodine	27.1	16 6	22 1
Follicular hyperkeratosis	Vitamin A and/or vitamin C	0 6	2.1	4 3
Bilateral edema	Thiamine	0 8	0.3	–
Bilateral loss of ankle jerk	Thiamine	1 8	2.6	1 7
Depigmentation of hair	Protein	6 6	2 0	10 4
Other		13.9	17.6	13 9

Source Interdepartmental Committee on Nutrition for National Defense, *West Indies Nutrition Survey*

an early age. A 1967 survey of 1,649, 8-9 year olds indicated poor diets and growth patterns significantly below the normal range. Other reports indicate a high prevalence of anemia (2,127 cases in 1969) and avitaminoses (1,078 cases in 1969). No signs of scurvy or Vitamin A deficiency have been identified as prevalent. Goiter has been observed but according to local physicians is less prevalent than in other regions of Central America.

In Belize, the conclusion must be that despite inadequate statistical methods the nutritional status is below the level identified for much of the Commonwealth Caribbean. This deficiency is even more apparent in certain ethnic groups particularly the Black Caribs. It appears that the potential for adequate nutrition is present but proper utilization and distribution of resources, nutrition education, and infrastructure development seem essential to achieving the potential.

The Leeward Islands: (St. Kitts-Nevis-Anguilla, Antigua, Montserrat, and the British Virgin Islands) and The Windward Islands, (Dominica, St. Lucia, St. Vincent, Grenada)

Other than sparse information available from the 1961 ICNND which covered only St. Lucia and St. Kitts little is

published regarding the nutritional status of the Leeward and Windward island populations. A need seems to exist to more thoroughly survey and document the nutritional status of the populations. Preliminary survey results from a CFNI study done in St. Vincent also add some data on nutritional status of the islands. Extrapolating from the available information and patterns developing in other Caribbean nations a picture of the nutritional status of these small islands can be drawn that is general but not quantified.

The total population of the Leeward and Windward Islands combined is 608,879.[1] This population occupies a land area of some 3838 square Km,[2] ranging from a population density of 595 per square km in Barbados to 14 per square km in Turks and Caicos.

Diets and Nutritional Levels of the Population

The results of the ICNND survey conducted in 1961 indicated that residents of St. Kitts-Nevis-Anguilla consumed a great deal more roots, tubers and sugar and less

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[1] Includes St. Kitts-Nevis-Anguilla, Turks and Caicos, Antigua, Montserrat, the British Virgin Islands, Dominica, St. Lucia, St. Vincent, and Grenada.

[2] Same as above.

breadfruit and bananas than the St. Lucians in the Windward Islands. Tables 8 and 9 show the average per capita daily consumptions for the two groups. The nutrient composition of these diets is compared in Tables 10 and 11. Both protein intake and calories appear fairly comparable although in examing the other nutrients the St. Kitts group appears to have a slightly lower nutritional intake. If we compare these 1961 figures to the 1966 figures supplied by CFNI we see a significantly lower total protein and calorie availability.

The questions raised by this data are: (1) Are these levels comparable across the smaller Leeward and Windward islands populations?; (2) Is this an accurate representation?; and (3) Have nutrition levels changed over the past 10-15 years?

The malnutrition levels indicated in Table XII for St. Vincent demonstrate that an average of 25% of the surveyed children suffered from moderately severe protein calorie malnutrition (PCM) with about 1-2% in the very severe PCM range. Marasmus was found to be more common than kwashiorkor (84% vs 16%). This indicates a caloric deficiency rather than a lack of protein intake.

May and McLellon felt that these severe nutritional

TABLE VIII

Average Per Capita Daily Food Consumption – St Lucia, 1961
(in grams)

	Castries	Gros Islets	Anse La Raye	Canaries	Dennery	Choiseul
Average Monthly Family Income	$58	$48	$22	$38	$74	$26
Food Item						
Cereals	191	130	137	89	281	118
Dried legumes	17	4	4	2	9	3
Greens	23	19	4	5	24	7
Other vegetables	22	36	13	16	29	14
Tubers	40	–	2	–		8
Mangoes	180	640	320	240	460	260
Breadfruit	214	1,230	900	1,140	940	1,368
Other fruits	80	77	247	342	469	134
Fish	70	150	80	62	117	121
Meat	100	17	8	6	21	2
Milk and products	151	134	21	58	180	43
Eggs	16	3	–		5	2
Fats	24	32	25	19	26	10
Sugar	41	34	35	27	31	21
Miscellaneous	3	3	2	2	3	2

Source: Interdepartmental Committee on Nutrition for National Defense, *West Indies Nutrition Survey*

TABLE IX

Average Daily Per Capita Consumption by Food Groups in Principal Towns – St Kitts-Nevis-Anguilla, 1961
(in grams)

	St Kitts			Nevis		Anguilla
Item	Basse-terre	Molyneux-Tabernacle	Old Road	Charles-town	Cotton-ground	Valley Road
Cereals	315	247	307	229	266	350
Dried legumes	10	8	9	7	17	10
Green vegetables	27	4	21	27	1	–
Other vegetables	15	8	7	5	4	14
Roots and tubers	68	32	37	29	49	39
Mangoes	18	–	45	123	32	–
Breadfruit	–	130	11	40	51	31
Other fruit	73	54	104	53	68	25
Fish	35	95	123	68	71	121
Meat	134	17	18	16	16	10
Milk and products	206	127	124	265	131	225
Eggs	15	5	10	3	2	–
Fats	23	28	13	23	25	63
Sugar	29	76	84	53	55	78
Miscellaneous	2	5	12	9	4	3

Source. Interdepartmental Committee on Nutrition for National Defense, *West Indies Nutrition Survey*

TABLE X

Average Calculated Daily Per Capita Nutrient Intake by Principal Towns – St. Kitts-Nevis-Anguilla, 1961

	St Kitts			Nevis		Anguilla
Nutrient	Basse-terre	Molyneux-Tabernacle	Old Road	Charles-town	Cotton-ground	Valley Road
Calories	2,087	1,792	1,742	1,645	1,876	2,036
Protein (g)	84	69	88	62 5	89	69
Carbohydrates (g)	273	282	248	259	267	302
Fats (g)	71	46	49	44	55	73
Calcium (mg)	376	310 5	467	411	453	355
Iron (mg)	9 6	7 8	8 6	6	7	7 6
Vitamin A (IU)	3,884	1,106	4,834	6,470	2,560	1,148
Thiamine (mg)	7	5	85	55	8	7
Riboflavin (mg)	93	92	72	82	9	6
Niacin (mg)	14	7.5	10 4	6.85	8 45	11 2
Vitamin C (mg)	22 8	27	20	34	26	14

Source Interdepartmental Committee on Nutrition for National Defense, *West Indies Nutrition Survey*

TABLE XI

Per Capita Daily Nutrient Intake – St Lucia, 1961

Nutrient	Castries	Gros Islets	Dennery	Canaries	Anse La Raye	Choiseul
Calories	2,287	2,582	2,570	1,854	2,187	2,040
Proteins (g)	82	85	86	40	64	61
Percent of animal protein	59	63	23	42	53	57
Carbohydrates (g)	321	460	487	345	369	331
Fats (g)	74	56	59	35	43	21
Calcium (mg)	431	560	553	590	405	431
Iron (mg)	7 7	17 0	16.0	15 6	15 1	12 4
Vitamin A (IU)	4,740	10.000	8,790	11,070	4,320	6,050
Thiamine (mg)	96	1 4	1.4	1 0	1 0	.96
Riboflavin (mg)	1 4	.96	1 05	92	66	1 14
Niacin (mg)	10 6	13 2	18 7	12 3	12 1	13 4
Ascorbic acid (mg)	47	223	186	124	136	250

Source. Interdepartmental Committee on Nutrition for National Defense, *West Indies Nutrition Survey*

TABLE XII

Malnutrition Among 2,490 Children of Both Sexes
St. Vincent, 1967

Age (months)	Moderately Severe PCM[a] (percent)	Very Severe PCM[b] (percent)
0–11	21.5	2 5
12–23	31.5	2 0
24–35	23 3	1 2
36–47	24 1	0 6
48–59	28 5	0.5
0–59	25.7	1.5

[a]Weight 61–80 percent of standard
[b]Weight below 60 percent of standard.

Source: Caribbean Food and Nutrition Institute, *A Rapid P.C.M. Survey in St Vincent.*

TABLE XIII

Daily Per Capita Supply of Calories and Proteins
St Vincent, 1966
(proteins in grams)

	Local Production		Imports		Total Available	
Food Item	Calories	Proteins	Calories	Proteins	Calories	Proteins
Cereals	5 0	0 1	660 0	17 0	665	17 1
Roots and tubers	191.0	2 8	–	–	191	2.8
Sugars	–	–	334 0	–	344	–
Pulses and seeds	20.0	1.3	7 0	0.5	27	1.8
Fresh vegetables	21.0	1 2	–	–	21	1 2
Fruits	44.0	1.0	–	–	44	1 0
Meats and products	31.9	2.0	20.1	1 3	52	3.3
Fish	15.1	3.0	17 5	3 4	33	6.4
Eggs	2 7	0 2	4 5	0.4	7	6
Milk and products	4 4	2.1	67 0	4.8	71	6 9
Fats and oils	–	–	156 0	–	156	–
Miscellaneous	–	–	8.0	0 2	8	0.2
Total	335.1	13 7	1,274.1	27 6	1.619	41.3

Source. Caribbean Food and Nutrition Institute, *A Rapid P C M Survey in St Vincent*

deficiencies observed in St. Vincent more closely approximated the nutritional status of the small island populations where surveys have not been completed.

Summary

We have seen then that nutrition levels are barely sufficient in many of the "more developed" Caribbean polities with pockets of malnutrition and nutritional disease prevalent in most countries. With limited quantitative data available on the less developed Caribbean countries it seems to follow that the nutritional status is even lower than in the more developed countries.

THE CARIBBEAN FOOD PLAN

The Food Situation

Over the past few years, the performance of agriculture throughout the Region has declined dangerously. This has resulted in shortages of various foods and a tide of rural people streaming to the urban raeas to swell the masses of unemployed.

During the last decade, the Region has switched from an agricultural surplus area, producing more agricultural products than it consumed, to an agricultural deficit area consuming more agricultural products than it produced.

The stagnation and decline in agricultural output was accompanied by a 33 percent drop in agriculturl employment between 1960 and 1970. In spite of this, agriculture still reamined the largest source of employment in the Region, providing jobs for 25 prcent of the labour force.

It is estimated that 44 percent of the Region's population do not consume the minimum level of protein and 56 percent are consuming less than the minimum calorie requirements.

A Colonial Agriculture

These problems of the regional agriculture sector have arisen largely because of its fundamental disorientation.

Historically, the regional agricultural sectors were integral parts of the metropolitan economy to which the colonies were tied. As such, they complemented the paramount metropolitan economy. But in these post-colonial times, the metropolitan economy is no more paramount. It is the regional economies which are paramount, and the colonial structure of regional agriculture is now totally unsuited to the demands of the regional economies.

In addition, the Regional was naturally fragmented and colonial policy did little to bring the Region together even economically. This would have helped to overcome the disadvanages of fragmentation and smallness through joint and cooperative regional effort.

Thus, the colonial agricultue produced largely for export to the developed countries, such as the UK and the US, and specialised in a few crops, largely sugar and bananas, and imported most of its food from the developed countries also, flour, white potatoes, saltfish, meat and butter, for example.

Further, the agricultural products exported were never processed to any extent but were sent in the raw state, such as raw sugar, raw coffee, raw cocoa and raw bay oil. These could have been processed into their final forms such as refined sugar, nescafe and bay oil based prfumes which would have brought more income from these exports and provided more employment in both

the rural and urban areas.

Finally, the large quantities of agricultural exports and imports were all transported in foreign ships and income and jobs were lost by not providing our own shipping. This is even more critical when one realizes that the CARICOM Countries are generally small with limited land resources, and the development of shipping would have complemented and extended those limited resources.

The Regional Food Plan is not yet complete at this early stage. So far, it consists of a draft legal instrument for the establishment of a commercial corporation for the production and marketing of food on a regional scale, a sub-sector programme for livestock, and certain specific projects for the early attention of the proposed Caribbean Food Corporation.

The Regional Food Plan

The Regional Food Plan recognizes the need to jointly combine the Region's resources of manpower, land, fertilizers and finance in a concerted effort to produce the area's food requirements. It emphasises the need to approach food production as a basic industry to be run on commercial lines to incorporate processing activities equal to the best in the world. The Plan also calls for market guarantees by each Member State and adequate transportation facilities to ensure viable regional

production and distribution.

The plan also recognizes the regional responsibility to distribute benefits of integration and consequently makes allowance for the effective participation of the ECCM countries. Finally, the Plan emphasizes the role of regional action in areas where national action alone would be inadequate for the solution of national and regional food problems.

PROGRESS TO DATE

The Caribbean Food Corporation

The Caribbean Food Corporation (CFC) proposed by the Working Party on Food Production of CFNI was accepted by the Heads of Government. Its main features are:

1) the CFC is to be established by Member Governments of the Common Market, as a holding company, operating a series of production subsidiaries and a marketing subsidiary;
2) the objectives of the Corporation shall include production, processing, distribution of food through the implementation o viable regional food production projects, which, on account of their large size and/or importance to the Region, their capital, management and other input requirements and their requirements for markets, cannot be successfully undertaken by the particular Member States in which they are to be

located;

3) the Corporation's activities will be carried out under the policy direction of a Board of Governors, consisting of Ministers of Agriculture of each participating country. Management of the Corporation will be the responsibility of a Board of Directors appointed by Member Countries.

Projects being undertaken in: 1) Corn and Soya Bean Products; 2) Livestock Production; 3) Fishing; 4) Fruit and Vegetable Production; and, 5) Traditional Export Crops.

Benefits of the Regional Food Plan

The objectives of these new directions in Regional Agriculture are embodied in the now widely accepted exhortation that CARICOM feeds itself. This may not be completely possible but it demonstrates the spirt of the regional movement and the determination of its peoples.

Arising out of this ambitious objective, the Region hopes to supply the greater part of its food imports with regionally produced food and significantly reduce the regional exchange food bill.

Such food production will provide a base for the critically needed rural agro-industrial development. It will provide more employment in the rural area, will contribute to higher levels of

rural (and urban) welfares, and will help stem the drift of rural people to the urban areas.

These benefits of the Regional Food Plan would have arisen largely from the potential afforded by the united Regional effort. But above all, when CARICOM feeds itself, we will have made the first major break with our traditional agriculture and will be on the road to the creation of a restrucuterd and truly dynamic agricultural sector, capable of responding to the urgent and paramount demands of the regional economies.

NOTES ON THE NUTRITIONAL CONSIDERATIONS IN THE DEVELOPMENT OF A REGIONAL FOOD PLAN

It is, essential that there should be some clear-cut nutritional considerations in any food plan if it is to realise its maximum efficiency and efficacy. Amidst all the quite legitimate concern over such issues as trade balances or agricultural productivity, care should be taken not to overlook the fundamental nutritional objective of satisfying the nutrient needs of the population.

To complete th perspective in which a Regional Food Plan should be viewed, it is therefore important that the highlights of the nutrition situation in the Caribbean should now be examined.

The Nutrition Situation

There is evidence that agricultural workers of both sexes have a deficient energy intake and, to a lesser degree, a deficient protein intake. The implications for national productivity of an inadequately fed work force should be considered.

Such data as are available also indicate that there is a significant short-fall, not only of calories, protein and iron,

but also in calcium, thiamine (B_1), riboflavin (B_2), niacin and vitamin A. As an example, in one of the larger CARICOM countries, Food Consumption Data show that:

39% of families suffer from calorie deficiency.
30% of families fail to meet adequate protein requirements.
30% of families fail to meet adequate iron requirements.
More than 50% of families fail to meet adequate riboflavin requirements.

These nutritional findings occur most commonly in certain human situations possessing a special blend of ecological factors, e.g., large family size, unemployment, small holdings, poor housing and environmental sanitation, low income.

In examining these nutritional deficiencies, it is worth noting that cereals and grains provide the largest contribution to the calorie and protein content of the diets of the people of the Caribbean taken as a whole. But these same foods make a proportionately greater contribution to the diet in the case of the lower socio-economic groups whose consumption of meat and fish and their products is relatively low. Although the reasons for this may not be entirely economic, there is no doubt that the high cost of meat and fish go a long way towards determining

complications for mother and child at chid-birth and afterwards.

It may seem somewhat paradoxical in the light of the above statements that obesity should be a problem in this Region. Although the extent of the problem is ill-defined, it is clear that it is largely an affliction of the middle-aged Caribbean woman, which bears a significant relationship to the high prevalence of diabetes mellitus in the Region.

Nutritional Considerations

As stated earlier, any plan to improve the food supply of the Region should go beyond the economic and trade implications and attempt to relate to the nutritional needs of the population and their eating habits. The following points should, therefore, receive special considerations:

a. It is of prime importance to increase the caloric intake of persons in the lower income groups, especially the larger family units in which there may be several small children. Direct approaches to increasing the protein intake are of secondary importance compared with meeting caloric requirements.

b. Meeting the nutrient needs, especially the caloric and protein needs of young children vulnerable to malnutrition should be considered a priority. In pursuing this objective, due consideration should be given to the more

extensive use of cereals, legumes and green vegetables. The feasibility of large-scale production of an inexpensive cereal-based weaning food from regional use in the fight against childhood malnutrition should receive urgent considerations.

c. Effective fortification of suitable foods such as counter flour with iron and selected vitamins should be developed as one practical approach to the reduction of the prevalence and severity of anaemia and other nutrient deficiencies.

d. Any plans for the greater production of meat and meat products should be weighed against increasing the production of cereals, pulses, nuts, oilseeds, although these activities should not be regarded as mutually exclusive. The availability of these foods at a price that is within the reach of the lower socio-economic groups is of critical importance in the improvement of nutritional status.

e. The large-scale developments foreseen in any regional plan will need to be supported by such services as extension workers and teachers with compentence in home economics and nutrition, if food patterns are to be modified or use of special foods intensified as part of the development strategy. It is, therefore, important that provision for

the training of such persons at university and other levels should develop pari passu with food expansion programmes.

f. The monitoring of the nutrient-cost of foods started by the Caribbean Food and Nutrition Institute should be seen as an integral part of a food policy, particularly in relation to the importation and price control of foods.

All of these measures have been incorporated in the food and nutrition policies which have so far been prepared for implementation in individual CARICOM countries. It is, therefore, logical that they should find a place in regional food and nutrition planning.

Since putting a plan into effect requires its translation into programmes and projects, it is strongly urged that all the above points be fully considered when programmes and projects within the regional food plan are being defined.

2. HEALTH STATUS OF THE POPULATION

No single measure or indice can be utilized when attempting to determine the health of a given population. Only when these indices are synergistically formulated to indicate the wide variety of factors that compose health status can any meaningful measure of that health status be induced. Among the factors that are commonly utilized to indicate health status are life expectancy, crude death rates, leading causes of death and maternal and infant death rates.

These factors are all essentially measures of disease and indicate the relative lack of health of a population rather than its healthy characteristics. The provide, however, as useful a measure of lack of health status as exists, although none provide a totally sensitive indicator. Infant mortality rates, usually one of the most sensitive indicators, for example, has been shown in recent studies to be less sensitive than was formerly thought to be the case.

Numerous caveats are in order when attempting to measure and define health status. The most obvious of these is the reliability of data regarding health status. Registration of deaths, and their proximate causes is incomplete and may be misleading. The extent and quality of

the medical certification of death varies according to availability of physicians or other forms of medical care.

Another important consideration that bears directly on the first is the relativism of the measurement system. In other words, the difference in the birth rate between Antigua and Barbados of 21.5 and 25.0 is essentially only meaningful in comparison and not as individual statistics.

Life Expectancy

Serving as a general indicator of health status of a population the average life expectancy in the Commonwealth Caribbean ranges from a low of 52 years in Montserrat and the British Virgin Islands to a high of 69 years in Barbados (1975). (Belize, Cayman Islands and Turks and Caicos figures are not available). The Commonwealth Caribbean's average life expectancy is 61.2 years slightly higher than the world average of 59 years. Life expectancy is a crude measure in that the average life expectancy does not take into consideration such contingencies as life expectancy after surviving the first year or two after birth. It is however, a good composite indicator of development.

PAHO decade goals for the 1960's were to increase life expectancy by five years. While such a goal can serve a

useful function in terms of a general measure of the total effect of all health programs and socio-economic development it cannot measure the contribution of specific health activities or programs. No assessment of quality of life or other specific impacts can be made from the life expectancy figures.[1] As was mentioned above underregistration of births, deaths, and other "vital statistics" can lead to misinterpreted health status. In particular, underregistration produces too low mortality rates and thus inflated life expectancy figures. An example of this may be indicated by demonstrating a trend in a sample country regarding life expectancy. In Jamaica in 1950 life expectancy was 59.1; in 1960, 68.3; and in 1972, 66.7. Are we to assume from these figures that the health status in Jamaica declined during the 1960's, that better registration methods were implemented, or that any number of other factors led to this decline.

Table B-I-a indicates the most recent figures for life expectancy and other population data. Examining the variance between the average of available figures it can be

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[1] Health Conditions in the Americas., op. cit. p. 12.

TABLE B-1-a
POPULATION DATA

AREA	Estimated population, July 1, 1975	Births per 1,000 population	Deaths per 1,000 population	Rate of natural increase	Time to double population	Population under age 15	Life expectancy at birth	Urban population	GNP per capita
	Thousands	Number	Number	Percent	Years	Percent	Years	Percent	Dollars
United States (the 50 States and the District of Columbia)..	213,631	15	9	0.6	116	27	71	74	6,210
Commonwealth Caribbean									
Belize	139	39	5	3.4	20	49	NA	54	700
Guyana	786	36	6	3.0	23	44	68	40	380
Antigua	73	18	7	1.1	63	43	62	40	480
Barbados	239	21	9	1.2	58	34	69	4	950
British Virgin Islands	11	25	6	1.9	36	39	52	12	NA
Cayman Islands	12	32	8	2.4	29	39	NA	39	NA
Dominica	75	36	10	2.6	27	49	58	17	360
Grenada	96	26	8	1.9	36	47	63	8	460
Jamaica	2,052	31	7	2.4	29	46	68	37	870
Montserrat	11	25	9	1.6	43	40	52	11	NA
St. Kitts, Nevis, and Anguilla	68	26	11	1.5	46	46	60	28	450
St. Lucia	107	41	9	3.2	22	50	57	5	480
St. Vincent	94	34	10	2.4	29	51	59	5	300
Trinidad and Tobago	1,088	26	7	2.0	35	40	66	12	1,200
Turks and Caicos Islands	6	32	10	2.2	32	47	NA	41	NA

seen that the more developed country life expectancy has a mean of 67.8 years while the LDC mean is almost 10 years less at 57.9 years.

The most important point to emphasize is that the rates shown may be overestimated by 10-15% (based on National Demographic Survey interpolations) but still represent a life expectancy (and hence health status) slightly above the world average. Estimates by PAHO indicate that if the goals to reduce infant and early childhood mortality in the Caribbean are realized, average life expectancy can be raised between 1.5 and 3.3 years.

Crude Deaths

Deaths per thousand in the Commonwealth Caribbean averaged 8.1 ranging from 5 in Belize to a high of 11 in St. Kitts-Nevis-Anquilla. Similar caveats to those indicated above apply to inferring health status levels of the population from crude death rates. It does not seem realistic that given the socio-economic conditions of Belize, for example, its crude death rate per 1,000 population is half that of the United States.

The crude death rate (Table B-I-b) is a readily available measure of total mortality in a country. As an

Table B-1-b

Number of Deaths with Rates per 1,000 Population,
By Country, 1960 and 1970-1974

AREA	1960	1970	1971	1972	1973	1974
Antigua	538	411	414	455	377	482
Barbados	2127	2064	2058	2108	2144	2113
Belize	717	797	618	669	777	721
Cayman Islands	54	59	67	68	76	68
Dominica	922	583	664	544	505	511
Grenada	1032	743	739	660	...	734
Guyana	5167	4788	5248	...	...	...
Jamaica	14321	13672	14437	13744	14157	14374
Montserrat	141	121	123	144	107	131
St. Kitts-Nevis and Anguilla	764	488	439	541	525	510
St. Lucia	1281	862	804	971	840	829
St. Vincent	1210	738	733	890	990	716
Trinidad and Tobago	6608	6956	7044	6955	7517	6936
Turks and Caicos Islands	60	47	59	...	52	...
Virgin Islands	67	57	59	63	62	75

Number of Deaths With Rates Per 1,000 Population,
By Country, 1960 and 1970-1974

AREA	1960	1970	1971	1972	1973	1974
Antigua	9.7	6.2	6.2	6.7	5.5	6.9
Barbados	9.1	8.7	8.6	8.8	8.8	8.7
Belize	7.9	6.6	5.0	5.2	5.9	5.3
Cayman Islands	6.3	5.4	6.1	6.2	6.9	6.2
Dominica	15.4	8.2	9.3	7.5	6.9	6.9
Grenada	11.5	7.9	7.9	6.9	...	7.6
Guyana	9.5	6.8	7.2	...	...	...
Jamaica	8.8	7.3	7.6	7.1	7.2	7.2
Montserrat	11.6	10.1	10.3	12.0	8.9	10.9
St. Kitts-Nevis and Anguilla	13.5	10.6	9.3	11.3	10.8	10.8
St. Lucia	14.9	8.5	7.8	9.3	8.0	7.7
St. Vincent	15.1	8.3	8.0	9.4	10.1	7.1
Trinidad and Tobago	7.9	6.8	6.8	6.6	7.1	6.4
Turks and Caicos Islands	10.6	7.8	9.8	...	8.7	...
Virgin Islands	8.5	5.7	5.9	6.3	5.6	6.8

index on which to base comparisons between countries, areas, or between different periods of time, it can be misleading since the age and sex distribution of population influences the total number of deaths. In a country where the number of persons in the older age groups is proportionately a larger part of the total population than in another, the crude death rate may be higher only because the risk of dying is greater.[2]

Table B-I-c attempts to compensate for this problem by indicating age adjusted death rates. Large differences between the age adjusted rates and crude death rates indicate a large proportion of the population in the older age groups when the standard being used is based on a young population, as it is in Table B-I-c.

Indications in the Caribbean are that the death rates (both crude and age-adjusted) are slightly higher than both the 7.92 (crude) and 7.91 (age-adjusted) means found for the remainder of Latin America. If we exclude the LDC Commonwealth Caribbean and utilize Jamaica, Trinidad and Tobago and Barbados as a standard the mean crude rate is 7.7

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[2] Health Conditions in the Americas, op. cit., p. 15.

Table B-1-c

Crude and Age-Adjusted Death Rates per 1,000 Population, by Country
1970-1972

	Crude Death Rate	Age-Adjusted Death Rate	Difference
Barbados	8.7	5.5	3.2
Jamaica	7.5	8.5	0.9
Trinidad and Tobago	6.8	6.8	-

and the age-adjusted rate is 6.3 which is significantly lower than the Latin-American average. This re-emphasizes the wide divergence in the types and health status of the Commonwealth Caribbean and possibly foreshadows the difficulty one might encounter in thinking in terms of regional programming.

Leading Causes of Death

One of the most useful indicators of a population's health status is an analysis of the leading mortality causes. Similar to other health status indicators the quality and extent of medical certification of death is often limited and hence accuracy of comparable data must be considered somewhat suspect.

In developed nations such as the United States and Canada the leading causes of death are:

1) diseases of the heart
2) malignant neoplasms
3) cerebrovascular disease
4) accidents
5) influenza and pneumonia

In the Caribbean, as shown in Table B-I-d, the leading causes of death similarly often contain diseases of the heart, malignant neoplasms, cerbrovascular disease and influenza and pneumonia. Accidents on the other hand are often replaced in the Caribbean "top five" by enteritis and other diarrheal diseases and/or causes of perinatal mortality.

When the data are analyzed by age group for mortality causes a pattern develops with enteritis and diarrheal diseases, causes of perinatal mortality, and avitaminoses and nutritional deficiencies appearing with some regularity in the younger age groups. Few figures are available from which to extrapolate in the 4-14 year age group. The 15-44 age group seems to have accidents as by far the largest cause of mortality often times 50% greater than the next leading cause. (Figures are available in this age-group only for Trinidad and Tobago, Jamaica and Barbados.) After age 44 the data for the "all ages" group is fairly consistent as this is the range in which one might expect most deaths to occur (given the average life expectancy).

Whereas in a large number of countries of the Americas a great percentage of deaths are due to ill-defined and unknown causes, it is significant that Jamaica, Barbados,

TABLE B-1-d

FIRST FIVE PRINCIPAL CAUSES OF DEATH WITH RATES PER 1,000 POPULATION, BY COUNTRY

AREA AND PRINCIPLE CAUSES	RANK ORDER	NUMBER	RATE	PER CENT
Antigua (1972)				
Total Deaths		455	623.3	100.0
Diseases of the Heart	1	103	141.1	22.6
Cerebrovascular Disease	2	77	105.5	16.9
Malignant Neoplasms	3	58	79.5	12.7
Enteritis and Other Diarrheal Diseases	4	20	27.4	4.4
Influenza and Pneumonia	5	17	23.3	3.7
Barbados (1972)				
Total Deaths		2108	878.3	100.0
Diseases of the Heart	1	480	200.0	22.8
Cerebrovascular Disease	2	290	120.8	13.8
Malignant Neoplasms	3	286	119.2	13.6
Influenza and Pneumonia	4	150	62.5	7.1
Causes of Perinatal Mortality	5	119	49.6	5.6
Diabetes Mellitus	-	93	38.8	4.4
Belize (1972)				
Total Deaths		669	523.5	100.0
Diseases of the Heart	1	83	65.0	12.4
Malignant Neoplasms	2	68	53.2	10.2
Influenza and Pneumonia	3	63	49.3	9.4
Enteritis and Other Diarrheal Diseases	4	57	44.6	8.5
Causes of Perinatal Mortality	5	39	30.5	5.8
Dominica (1971)				
Total Deaths		664	922.2	100.0
Diseases of the Heart	1	105	145.8	15.8
Malignant Neoplasms	2	63	87.5	9.5
Causes of Perinatal Mortality	3	53	73.6	8.0
Enteritis and Other Diarrheal Diseases	4	52	72.2	7.8
Influenza and Pneumonia	5	48	66.7	7.2
Accidents	-	24	33.3	3.6
Jamaica (1971)				
Total Deaths		14437	761.0	100.0
Diseases of the Heart	1	2501	131.8	17.3
Cerebrovascular Disease	2	2200	116.0	15.2
Malignant Neoplasms	3	1583	83.4	11.0
Influenza and Pneumonia	4	954	50.3	6.6
Enteritis and Other Diarrheal Diseases	5	688	36.3	4.8
Accidents	-	549	28.9	3.8
Diabetes Mellitus	-	593	31.3	4.1

St. Kitts - Nevis and Anguilla				
Total Deaths.....		541	1129.4	100.0
Cerebrovascular Disease...	1	77	160.8	14.2
Diseases of the Heart.....	2	72	150.3	13.3
Influenza and Pneumonia...	3	44	91.9	8.1
Causes of Perinatal Mortality.....	3	44	91.9	8.1
Malignant Neoplasms.....	5	38	79.3	7.0
St. Lucia (1972)				
Total Deaths.....		971	844.3	100.0
Diseases of the Heart.....	1	122	106.1	12.6
Influenza and Pneumonia...	2	121	105.2	12.5
Cerebrovascular Disease...	3	86	74.8	8.9
Causes of Perinatal Mortality.....	4	78	67.8	8.0
Enteritis and Other Diarrheal Diseases.....	5	74	64.3	7.6
Accidents.....	-	44	38.3	4.5
Senign Neoplasms of Unspecified Nature.....	-	69	60.0	7.1
St. Vincent (1972)				
Total Deaths.....		890	978.0	100.0
Diseases of the Heart.....	1	169	185.7	19.0
Enteritis and Other Diarrheal Diseases.....	2	121	133.0	13.6
Avitaminoses and Other Nutritional Deficiency...	3	62	68.1	7.0
Causes of Perinatal Mortality.....	4	59	64.8	6.6
Malignant Neoplasms.....	5	52	57.1	5.8
Influenza and Pneumonia...	-	49	53.8	5.5
Accidents.....	-	44	48.4	4.9
Trinidad and Tobago (1971)				
Total Deaths.....		7044	682.2	100.0
Diseases of the Heart.....	1	1785	172.9	25.3
Cerebrovascular Disease...	2	876	84.8	12.4
Malignant Neoplasms.....	3	648	62.8	9.2
Influenza and Pneumonia...	4	407	39.4	5.8
Accidents.....	5	392	38.0	5.6
Diabetes Mellitus.....	-	390	37.8	5.5
United States (1971)				
Total Deaths.....		1927542	934.7	100.0
Diseases of the Heart.....	1	751205	364.3	39.0
Malignant Neoplasms.....	2	337398	163.6	17.5
Cerebrovascular Disease...	3	209092	101.4	10.8
Accidents.....	4	118487	57.5	6.1
Influenza and Pneumonia...	5	57194	27.7	3.0

and Trinidad and Tobago are all under 10% of deaths from these causes. Barbados and Trinidad and Tobago are acutally around 5% (see Table B-1-e). Figures for the LDC Commonwealth Caribbean could be expected to be somewhat higher. No estimates appear to exist on the numbers or percentages of unreported deaths.

For regional comparisons Table B-1-f indicates the numbers and percentage of deaths that occur as the result of enteritis, diarrheal diseases, infective and parasitic diseases. While figures are only available again for Barbados, Jamaica, and Trinidad and Tobago it is significant to note the lower rates and percentages of these countries in relation to the bulk of Latin America. Progress in recent years with regard to methods for the prevention and control of the infective diseases makes the statistical percentage of deaths due to infective, and parasitic diseases, such as enteritis a useful index of health program development of a country. It would be inaccurate to interpolate the MDC figures to the LDC Caribbean nations.

Another interesting, if alarming, statistic is the high rate of mortality from malignant neoplasms of the cervix uteri. Jamaica, Trinidad and Tobago, and Barbados comprise 3 of the first four leaders in mortality from this disease.

TABLE B-1-e

PERCENTAGE OF DEATHS DUE TO ILL-DEFINED AND UNKNOWN CAUSES IN COUNTRIES OF THE AMERICAS, 1968 AND 1972

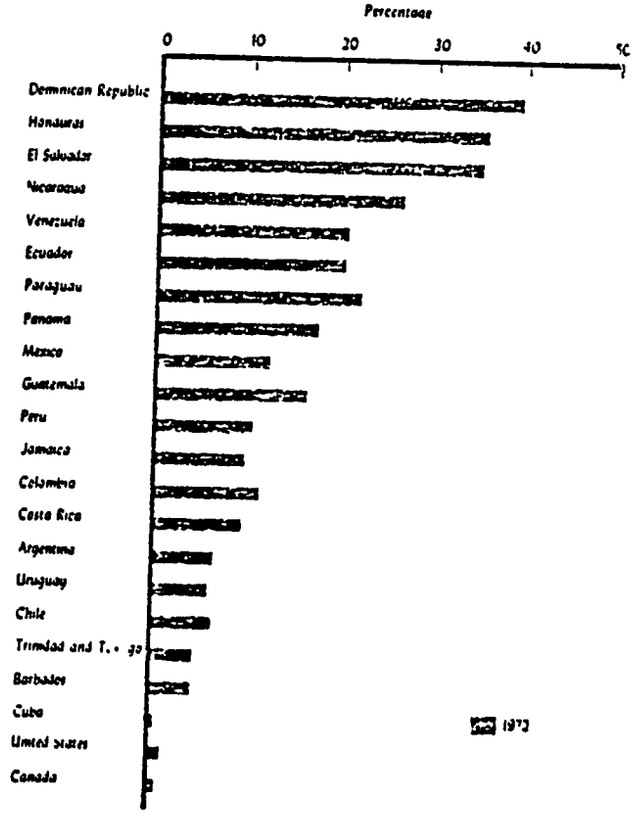

TABLE B-1-f

Number and Per Cent of Deaths from Enteritis and Other Diarrheal Diseases, and Other Infective and Parasitic Diseases with Rates per 100,000 Population by Country, 1968 and 1972

Country	Enteritis and other diarrheal diseases						Other infective and parasitic diseases					
	Number		Rate		Per cent		Number		Rate		Per cent	
	1968	1972	1968	1972	1968	1972	1968	1972	1968	1972	1968	1972
Argentina	a) 4544	b) 5538	19.9	23.9	2.0	2.5	a) 9285	b) 9877	40.6	42.6	4.2	4.4
Barbados	20	14	7.9	5.8	1.0	0.7	65	43	25.6	17.9	3.2	2.0
Canada	a) 264	29[illegible]	1.3	1.4	0.2	0.2	a) 999	966	4.6	4.4	0.6	0.6
Chile	4533	3631	48.5	35.9	5.4	4.1	5227	4601	55.9	45.5	6.2	5.2
Colombia	18331	a) 16356	95.0	79.9	11.1	10.6	16831	a) 14605	84.9	71.4	10.0	9.5
Costa Rica	1408	997	86.2	54.1	13.2	9.2	906	858	55.4	46.6	8.5	7.9
Cuba	1481	848	18.1	9.7	2.7	1.7	2816	1553	34.3	17.8	5.2	3.1
Dominican Republic	3535	2623	92.1	60.9	12.7	9.5	1554	1674	40.5	38.9	5.8	6.1
Ecuador	4653	c) 7535	81.7	119.7	7.5	11.8	10424	c) 8637	183.0	137.2	16.9	13.5
El Salvador	1672	c) 4185	51.2	117.9	5.6	14.6	2411	c) 2067	73.8	58.2	8.1	7.2
Guatemala	a) 19647	c) 14216	391.8	265.8	23.1	18.9	a) 15717	c) 15424	313.5	283.4	18.5	20.5
Honduras	1244	2677	51.6	99.6	6.0	12.4	2017	2652	83.6	98.7	9.8	12.3
Jamaica	992	c) 668	54.4	36.3	6.8	4.8	416	c) 432	22.8	23.3	2.9	3.0
Mexico	a) 63450	66864	133.6	127.0	13.6	14.0	38223	46323	83.4	88.0	8.4	9.7
Nicaragua	2299	a) 2764	124.8	144.3	15.3	17.3	1820	a) 1655	98.8	96.9	12.1	11.6
Panama	615	512	45.6	33.6	6.4	5.6	1186	901	88.0	59.1	12.4	9.9
Paraguay	1401	1105	120.9	94.7	11.2	9.3	1159	803	100.0	61.6	9.2	6.8
Peru	7793	b) 10227	61.0	75.3	7.9	9.1	12732	b) 19813	99.7	145.8	12.8	17.7
Trinidad and Tobago	a) 257	c) 374	25.0	26.5	3.6	3.9	a) 175	c) 130	17.0	12.6	2.5	1.8
United States	2940	c) 2466	1.5	1.2	0.2	0.1	14653	c) 13551	7.4	6.6	0.8	0.7
Uruguay	583	c) 312	20.0	10.7	2.2	1.1	731	c) 635	25.9	21.7	2.8	2.2
Venezuela	4511	5640	46.6	51.7	7.0	7.7	4337	5201	46.6	47.6	6.7	7.1
Northern America	3204	2764	1.5	1.2	0.2	0.1	15835	14527	7..	6.4	0.8	0.7
Middle America	96600	96662	123.7	112.8	13.1	13.1	67306	73912	88.0	86.2	9.2	10.0
South America	46839	50344	55.9	56.7	6.3	6.7	60726	64172	72.5	72.2	8.2	8.5

(a) 1969. (b) 1970. (c) 1971. (d) Area of information only.

TABLE B-1-g-

NUMBER OF DEATHS AMONG CHILDREN UNDER 5 YEARS WITH RATES PER 1,000 POPULATION, BY AGE AND BY COUNTRY

NUMBER

COUNTRY	YEAR	UNDER 5 YEARS	UNDER 1 YEAR					1 YEAR	2 YEARS	3 YEARS	4 YEARS
			TOTAL	UNDER 1 DAY	1-6 DAYS	7-27 DAYS	28 DAYS TO 11 MONTHS				
ARGENTINA	1970	38256	32044	3358	5649	4377	18660	3641	1323	726	522
BARBADOS	1972	209	180	31	79	33	37	14	8	4	3
CANADA	1971	7586	6356	2644	1312	529	1071	437	290	264	239
CHILE	1972	22637	19752	2467	2874	2721	11690	1522	639	383	341
COLOMBIA	1969	66387	42131	4677	6299	5821	25334	12570	←	11686	→
COSTA RICA	1972	3973	3142	...	...	...	...	←		831	→
CUBA	1972	8098	7129	1836	2050	866	2377	468	215	156	139
DOMINICAN REPUBLIC	1971	11444	7962	633	1642	1588	4099	1817	907	475	283
ECUADOR	1971	32835	19119	825	1974	3481	12839	7749	3325	1615	1027
EL SALVADOR	1971	12191	8099	664	973	1205	5257	2063	980	600	449
GUATEMALA	1971	37411	18736	...	...	...	...	8756	4886	3019	2014
HONDURAS	1972	8883	5260	196	574	652	3838	1648	896	636	443
JAMAICA	1971	2816	1743	...	...	...	...	←		1068	→
MEXICO	1971	200308	141261	7118	25412	19787	88944	29614	15005	8951	5477
NICARAGUA	1969	6701	4420	47	337	537	3499	1225	478	325	253
PANAMA	1972	2941	1851	257	409	298	887	568	251	149	122
PARAGUAY (a)	1971	4851	3106	...	...	...	...	979	355	253	158
PERU	1970	53993	31212	...	...	...	...	12162	5887	2880	1852
TRINIDAD AND TOBAGO	1971	973	744	84	190	148	322	116	57	37	19
UNITED STATES	1971	79212	67981	29150	16423	4923	17485	4272	2791	2235	1933
URUGUAY	1971	2918	2663	469	617	323	1254	133	60	31	31
VENEZUELA	1972	29153	21335	2913	3985	2848	11589	4492	1697	971	658

RATE

COUNTRY	YEAR	UNDER 5 YEARS	UNDER 1 YEAR (b)					1 YEAR	2 YEARS	3 YEARS	4 YEARS
			TOTAL	UNDER 1 DAY	1-6 DAYS	7-27 DAYS	28 DAYS TO 11 MONTHS				
ARGENTINA	1970	15.7	65.2	6.8	11.5	8.9	38.0	7.5	2.7	1.5	1.1
BARBADOS	1972	7.7	33.9	5.8	14.9	6.2	7.0	2.9	1.5	0.7	0.5
CANADA	1971	4.2	17.5	7.3	3.6	1.5	5.2	1.2	0.8	0.7	0.7
CHILE	1972	16.1	71.1	8.9	10.3	9.8	42.1	5.3	2.3	1.4	1.2
COLOMBIA	1969	18.7	62.7	7.0	9.4	8.7	37.7	20.6	←	5.2	→
COSTA RICA	1972	12.1	59.0	...	...	...	...	←		3.0	→
CUBA	1972	6.2	28.7	7.4	8.3	3.5	9.6	1.7	0.8	0.6	0.5
DOMINICAN REPUBLIC	1971	15.7	49.2	1.9	10.1	9.8	25.3	15.3	6.4	3.1	1.9
ECUADOR	1971	28.3	78.5	3.4	8.1	14.3	52.7	34.6	14.1	6.9	4.5
EL SALVADOR	1971	19.6	52.5	4.3	6.3	7.8	34.1	20.7	8.2	4.8	3.6
GUATEMALA	1971	39.6	84.1	...	...	...	...	46.4	26.3	17.1	11.8
HONDURAS	1972	17.1	43.0	1.6	4.7	5.3	31.4	15.5	9.2	6.6	4.6
JAMAICA	1971	9.4	26.4	...	...	...	...	←		4.6	→
MEXICO	1971	20.6	63.3	3.2	11.4	8.9	39.9	15.2	7.9	4.8	3.1
NICARAGUA	1969	19.6	54.4	0.6	4.1	6.6	43.1	24.0	7.1	4.5	3.6
PANAMA	1972	11.7	33.7	4.7	7.4	5.4	16.2	11.5	5.1	3.0	2.5
PARAGUAY (a)	1971	25.2	97.1	...	...	...	...	22.7	7.2	5.3	3.3
PERU	1970	23.5	66.9	...	...	...	...	25.2	12.6	6.4	4.3
TRINIDAD AND TOBAGO	1971	7.3	28.5	3.2	7.3	5.7	12.3	4.8	2.2	1.3	0.7
UNITED STATES	1971	4.6	19.1	8.2	4.6	1.4	4.9	1.2	0.8	0.7	0.6
URUGUAY	1971	9.8	40.4	7.1	9.4	4.9	19.0	2.4	1.0	0.5	0.5
VENEZUELA	1972	16.3	51.7	7.1	9.6	6.9	28.1	14.2	4.8	2.7	1.9

(a) Area of information only. (b) Per 1,000 live births

Similarly Trinidad and Tobago, Barbados and Jamaica have the three highest age-adjusted death rates per 100,000 population from diabetes in Latin America. Trinidad and Tobago also has the highest age-adjusted death rate for diseases of the heart and is joined by Barbados and Jamaica as the highest in levels of hypertensive heart disease and cerbrovascular disease. This may simply represent a higher diagnostic capability, however. It must be kept in mind, that a higher rate in any disease category means a lower rate in another category, in all, totaling the death rates discussed earlier in this chapter.

Child and Infant Mortality

One of the pressing health problems in the Caribbean and Latin America as a whole is the high rate of infant and childhood mortality. While the Caribbean rates are not as high as many other Latin American countries (greater than 40% of all deaths are under five years of age in 9 countries) the rates still indicate a critical problem area. The figures for the MDC's shown in comparison to other Latin American countries in Table B-1-h do not give an adequate appraisal of the overall Caribbean problems. In 1972 infant mortality figures, St. Kitts-Nevis-Anguilla and St. Vincent

TABLE B-1-h

NUMBER OF INFANT DEATHS WITH RATES PER 1,000 LIVE BIRTHS, BY COUNTRY, 1960,1965 AND 1969-1972

AREA	1960	1965	1969	1970	1971	1972	1973	1974
Antigua	129	79	47	34	33	30	15	...
Barbados	472	251	217	224	151	180	170	165
Belize	263	225	220	226	148	167	197	196
Cayman Islands	3	4	...	3	...	...	1	5
Dominica	302	151	156	113	138	...	86	61
Grenada	313	126	110	90	75	47	...	86
Guyana	1427	1035	...	...	...	...	...	...
Jamaica	3522	2710	2159	2071	1748	...	1622	1617
Montserrat	41	21	10	17	11	10	12	8
St. Kitts-Nevis and Anguilla	238	110	56	56	72	86	62	66
St. Lucia	454	183	197	211	148	225	180	119
St. Vincent	526	262	311	195	182	258	323	195
Trinidad and Tobago	1491	1216	1000	866	744	...	850	563
Turks and Caios Islands	20	17	...	8	9	...	9	...
United States	110873	92866	75073	74667	67981			
Virgin Islands (UK)	21	...	13	11	7	16	11	6

AREA	1960	1965	1969	1970	1971	1972	1973	1974
Antigua	68.7	45.4	30.8	22.1	19.4	19.1	11.9	...
Barbados	60.3	39.5	41.8	45.9	29.2	33.9	33.7	34.0
Belize	64.3	48.5	46.3	50.7	...	33.7	38.6	...
Cayman Islands	11.4	16.6	...	11.0	...	...	3.2	17.9
Dominica	107.3	53.6	57.9	45.1	...	...	33.2	...
Grenada	77.9	42.5	39.9	32.8	26.1	16.0	...	31.5
Guyana	61.4	44.7	...	...	...	...	...	...
Jamaica	51.5	38.8	33.4	32.2	26.4	...	26.2	26.3
Montserrat	114.2	54.8	37.9	56.3	40.9	31.4	40.7	26.3
St. Kitts-Nevis and Anguilla	98.1	59.1	45.7	48.4	65.0	69.6	52.3	57.7
St. Lucia	107.1	41.9	46.8	42.7	36.2	52.3	42.0	30.4
St. Vincent	132.0	69.5	99.6	58.6	49.0	69.6	99.6	57.8
Trinidad and Tobago	45.4	38.1	39.8	34.4	28.5	...	32.4	22.0
Turks and Caicos Islands	79.4	114.1	...	45.5	47.4	...	48.4	-
United States	26.0	24.7	20.9	20.0	19.1	18.5	-	...
Virgin Islands	75.3	...	54.6	35.1	23.3	52.6	44.9	24.5

had rates in excess of 69 per 1,000 live births. Comparable ratios in the U.S. and Canada, for example, were around 17 per 1,000. While few countries achieved the 50% reduction goal outlined in the Charter of Punta del Este a 40% reduction has been proposed for the 1970's.

Neonatal mortality (under 1 month) is associated with the condtions surrounding the child at birth and can give some indication of the levels of antepartum care received by the mother (as well as other factors such as nutrition, types of birth attendant, etc.). Postneonatal mortality (1-11 months) figures indicate, to a certain extent, the environment in which the child lives, the care rendered by the mother, nutrition levels and other environmental considerations.

In the Caribbean area the rates of infant mortality (under 1 year) are available but neonatal and post neaonatal figures are available only for Trinidad and Tobago, and Barbados. The neonatal rates for those countries in the aggregate are 26.9 for Barbados and 16.2 for Trinidad and Tobago or an average rate of 21.6. This places the health status comparatively near the mean for the Latin American region but still a significant problem when compared to a 14.2 rate per 1,000 live births for the U.S. or the 12.4

rate for Canada. It also is important to remember that these are rates for the MDC's in the Commonwealth Caribbean and it would be expected that the LDC's would have a significantly higher rate.

Looking at the infant mortality rates for the area the average of all Commonwealth Caribbean countries is 38.8 infant deaths per 1,000 live births for the latest years available. The rate for the MDC's (Barbados, Jamaica, and Trinidad and Tobago) are 29.6 while the LDC rate is 41.0. Only Chile and Paraguay have higher rates than St. Kitts and St. Vincent (69.6/1000 live births) in the Latin America Region (from available figures).

With regard to child mortality (under 5 years of age) Table B-1-i indicates the rates for the countries for which data were available. The average child mortality rate for the area was 3.40 with the MDC average 2.67 and the LDC 3.98 deaths per 1,000 population. Comparable U.S. figures were 0.8 deaths per 1,000 population while Canada had a 0.9/1,000 ratio. The trend has been towards decreasing mortality in this age grouping but due to the preventable nature of many of the causes of death for young children much additional progress is also possible.

TABLE B-1-i

Number of Deaths 1-4 Years of Age With Rates Per 1,000 Population, By Country, 1960 and 1970-1974

AREA	1960	1970	1971	1972	1973	1974
Antigua	53	13	6	4	9	...
Barbados	90	47	25	29	25	28
Belize	88	74	56	75	81	65
Cayman Islands	...	...	...	1	-	1
Dominica	168	50	61	36	39	39
Grenada	179	58	37	19	...	...
Guyana	444	...	...	...	...	...
Jamaica	1454	972	1068	...	...	...
Montserrat	9	4	3	4	2	...
St. Kitts-Nevis and Anguilla	117	(a)23	(a)11	(a)21	(a)13	201
St. Lucia	254	61	41	64	87	(a)12
St. Vincent	...	72	54	86	...	36
Trinidad and Tobago	343	197	229	163	204	69
Turks and Caicos Islands	...	...	...	...	...	...
Virgin Islands	...	1	3	-	2	...
						...

Table B-1-i (cont.)

Number of Deaths 1-4 Years of Age With Rates Per 1,000 Population, By Country, 1960 and 1970

AREA	1960	1970	1971	1972	1973	1974
Antigua	7.9	1.6	0.7	0.5	1.1	...
Barbados	3.5	2.2	1.2	1.3	1.1	1.3
Belize	6.7	4.3	3.1	4.1	4.1	3.4
Cayman Islands	...	...	...	0.8	-	0.8
Dominica	19.9	4.9	5.8	3.4	3.7	3.6
Grenada	12.8	4.4	2.8	1.4	...	...
Guyana	5.8	...	...	...	...	...
Jamaica	6.5	4.2	4.5	...	...	...
Montserrat	6.5	3.0	2.3	3.0	1.5	...
St. Kitts-Nevis and Anguilla	13.9	4.1	1.9	3.6	2.2	2.0
St. Lucia	21.7	4.0	2.6	4.1	5.5	2.2
St. Vincent	...	5.3	3.8	5.9	...	4.9
Trinidad and Tobago	3.2	1.8	2.1	1.5	1.9	...
Turks and Caicos Islands	...	...	...	...	...	...
Virgin Islands	...	0.8	2.5	-	1.5	...

Maternal Deaths

Table B-1-j indicates the levels of maternal death rates for the Caribbean. As can be seen the figures are sketchy and hence accuracy or conclusive data are not to be readily assumed. The MDC average is 11.9 per 10,000 live births while the LDC average is surpisingly 10.9. This further leads one to believe that the figures are less than completely accurate.

TABLE B-1-j

Number of Maternal Deaths With Rates Per 10,000 Live Births,

By Country, 1960 and 1970-1974

AREA	NUMBER					
	1960	1970	1971	1972	1973	1974
Antigua	10	3	-	-	1	...
Barbados	17	7	7	4	5	7
Belize	6	2	2	4	1	3
Cayman Islands	...	-	-	-	-	1
Dominica	...	1	1	1	-	2
Grenada	5	...	...	...	...	2
Guyana	...	...	...	...	...	...
Jamaica	137	68	90	...	...	...
Montserrat	...	-	1	-	-	...
St. Kitts-Nevis and Anguilla	6	2	1	1	1	-
St. Lucia	14	3	3	2	3	2
St. Vincent	...	3	2	3	2	2
Trinidad and Tobago	43	34	38	42	38	...
Turks and Caicos Islands	...	...	...	...	1	...
Virgin Islands	...	-	1	-	1	...

3. COMMUNICABLE DISEASES

In 1971 an average 24.5 deaths per 100,000 population in the Commonwealth Caribbean were from communicable diseases. This compares with a North American average of 4.2, a South American average of 69.3, and a composite Middle American average of 79.6. While the Caribbean compares favorably with both the Middle American and South American figures nearly 25 deaths per 100,000 population from communicable diseases still constitutes a serious health problem. Many of these diseases could be eliminated through immunization. In many cases, the reporting systems for communicable diseases are lacking. In several cases more deaths are reported from a disease than cases of the disease are reported. It is important to keep this in mind when examining the figures presented.

Table B-1-4 indicates by country the death rates per 100,000 population from communicable diseases, by country for those for which data is available. The 1971 mean rate for the less developed countries is 27.0 while the more developed countries have a rate of 16.1 deaths per 100,000. In 1972 St. Lucia had a rate of 73.9 indicating that rates can vary significantly from year to year.

Of the three diseases subject to international health regulations (Plague, Smallpox, and Yellow Fever) none are present

SOURCE: Reported Cases of Notifiable Diseases in the ... P.A.H.O. Scientific Publication No. ...

TABLE B-1-k

DEATHS AND RATES PER 100,000 POPULATION FROM COMMUNICABLE DISEASES, BY COUNTRY, 1970-1972

DISEASES	ANTIGUA						BARBADOS						BELIZE						DOMINICA					
	DEATHS			RATES			DEATHS			RATES			DEATHS			RATES			DEATHS			RATES		
	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972
AMEBIASIS	-	-	-	-	-	-	-	-	1	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
ANCYLOSTOMIASIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRAX	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-	***	***	-	-	-	-	-	-	-
BOTULISM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRUCELLOSIS	-	-	-	-	-	-	-	1	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
CHICKENPOX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIPHTHERIA	-	-	-	-	-	-	1	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DYSENTERY, BACILLARY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENCEPHALITIS, VIRAL 062-064, 066-069	-	-	-	-	-	-	-	1	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
ERYSIPELAS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FILARIAL INFECTION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FOOD POISONING (EXCEPT 005.1)	***	***	-	***	***	-	***	***	-	***	***	-	***	***	-	***	***	-	-	-	-	-	-	-
GONOCOCCAL INFECTIONS	-	1	-	-	-	-	3	1	2	1.3	-	1.3	1	-	-	0.8	-	-	-	-	-	-	-	-
HEPATITIS, INFECTIOUS	-	-	-	-	-	1.4	3	5	2	1.3	2.1	0.8	1	1	-	0.8	0.8	-	-	-	-	-	-	-
HYDATIDOSIS	1	1	-	4.3	4.3	-	11	12	5	4.6	5.0	2.1	2	1	***	1.6	0.8	-	-	-	-	-	-	-
INFLUENZA	-	-	-	-	-	-	1	-	1	0.4	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
LEPROSY	-	-	-	-	-	-	-	2	-	-	0.8	-	***	***	***	***	***	***	-	-	-	-	-	-
LEPTOSPIROSIS	-	-	-	-	-	-	***	-	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MALARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MEASLES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MENINGOCOCCAL INFECTION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MUMPS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PARATYPHOID FEVER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLAGUE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POLIOMYELITIS, ACUTE 040-044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RABIES	-	-	-	-	-	-	1.4	-	-	3	4	3	1.3	1.7	1.3	-	-	-	-	-	-	-	-	-
RELAPSING FEVER	-	1	-	-	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RHEUMATIC FEVER, ACTIVE 390-392	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RICKETTSIOSIS, OTHER 081.1-081.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SALMONELLA INFECTIONS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CIDEN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCHISTOSOMIASIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMALLPOX	-	-	-	-	-	-	2.9	1.4	-	5	3	8	2.1	1.3	3.3	-	-	-	-	-	-	-	-	-
STREPTOCOCCAL SORE THROAT AND SCARLET FEVER 034	-	-	-	-	-	-	4.3	4.3	-	3	10	7	1.3	4.2	2.9	-	-	-	-	-	-	-	-	-
SYPHILIS 090-097	2	1	-	4.3	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TETANUS 037	3	1	-	-	-	-	8	11	6	3.4	4.6	2.5	1	-	-	-	-	-	-	-	-	-	-	-
TRYPANOSOMIASIS, AMERICAN 086	-	-	-	-	-	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TUBERCULOSIS 010-019	5	3	2	7.1	4.3	2.7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TYPHOID FEVER 001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TYPHUS, ENDEMIC FLEA-BORNE 080.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TYPHUS, EPIDEMIC LOUSE-BORNE 080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WHOOPING COUGH 033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YELLOW FEVER 060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE B-1-k

DEATHS AND RATES PER 100,000 POPULATION FROM COMMUNICABLE DISEASES, BY COUNTRY, 1970-1972 (CONTINUED)

DISEASE	JAMAICA						ST. KITTS-NEVIS AND ANGUILLA (A						ST. LUCIA						ST. VINCENT						TRINIDAD AND TOBAGO					
	DEATHS			RATES			DEATHS			RATES			DEATHS			RATES			DEATHS			RATES			DEATHS			RATES		
	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972	1970	1971	1972
AMEBIASIS 006	***	-	***	***	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	-	***	-	***	***	***	***	***	***
ANCYLOSTOMIASIS 127	6	2	***	0.3	0.1	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	***	-	***	***	***	***	***	***
ANTHRAX 022	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	2	***	***	0.2	***
BOTULISM 005.1	***	***	***	***	***	***	***	-	-	***	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
BRUCELLOSIS 023	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	***	-	-	***	***	***	***	***	***	***
CHICKENPOX 052	***	-	***	***	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
DIPHTHERIA 032	7	8	***	0.4	0.4	***	-	1	-	-	2.1	-	-	-	1	-	-	2.6	-	-	1	-	-	1.1	***	1	***	***	0.1	***
DYSENTERY, BACILLARY . . . 004	***	1	***	***	0.1	***	-	-	1	-	-	6.3	-	-	-	-	-	-	-	***	-	-	***	-	***	***	***	***	***	***
ENCEPHALITIS, VIRAL 062-064,CP8.7	4	9	***	0.2	0.5	***	-	-	***	-	-	***	***	***	-	***	***	-	1	-	-	5.6	-	-	***	1	***	***	0.1	***
ENCEPHALITIS 035	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
ENTERAL INFECTION 125	-	-	***	-	-	***	1	-	-	2.2	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
OTHER PROTOZOAL & HELMINTHIC 129	***	***	***	***	***	***	***	-	-	***	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
GONOCOCCAL INFECTIONS . . . 098	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	1	***	-	1.1	-	***	***	***	***	***	***
HEPATITIS, INFECTIOUS . . . 070	24	20	***	1.3	1.1	***	-	2	-	-	4.3	-	***	***	1	***	***	0.9	1	1	1	1.1	1.1	1.1	***	-	***	***	-	***
HYDATIDOSIS 122	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	6	***	***	0.6	***
INFLUENZA 470-474	98	51	***	5.1	2.7	***	-	-	-	-	-	-	-	-	42	-	-	36.5	-	-	4	-	-	4.6	***	-	***	***	-	***
LEPROSY 030	4	3	***	0.2	0.2	***	-	1	-	-	2.1	-	***	***	1	***	***	0.9	-	-	1	-	-	1.1	***	17	***	***	1.6	***
LEPTOSPIROSIS 100	***	***	***	***	***	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	12	***	***	1.2	***
MALARIA 084	1	2	***	0.1	0.1	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	***	***	***	***
MENINGITIS 047	21	27	***	1.1	1.4	***	1	-	-	2.2	-	-	-	-	-	-	-	-	1	-	-	1.1	-	-	***	-	***	***	-	***
MENINGOCOCCAL INFECTIONS . . 036	1	-	***	0.1	-	***	1	-	-	2.2	-	-	-	-	1	-	-	0.9	-	-	-	-	-	-	***	2	***	***	0.2	***
MUMPS 072	***	***	***	***	***	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	1	***	***	0.1	***
PARATYPHOID FEVER 002	***	2	***	***	0.1	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	***	***	***	***	***
PLAGUE 020	-	-	***	-	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	***	***	-	***
POLIOMYELITIS, ACUTE 040-043	-	-	***	-	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	7.7	***	2	***	***	0.2	***
RABIES 071	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	***	***	***	***	***
RELAPSING FEVER 085	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
RHEUMATIC FEVER, ACTIVE 390-392	9	11	***	0.5	0.6	***	-	2	-	-	4.3	-	1	3	5	0.9	2.7	4.3	1	1	-	1.1	1.1	-	***	4	***	***	0.4	***
RICKETTSIOSIS, OTHER 081.1-083	-	***	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	***	***	-	***
RUBEOLLA INFECTIONS, FETAL 003	***	***	***	***	***	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***
SCHISTOSOMIASIS 120	-	-	***	-	-	***	-	-	-	-	-	-	***	***	1	***	***	0.9	-	-	-	-	-	-	***	-	***	***	-	***
SMALLPOX 050	-	-	***	-	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	***	***	-	***
STREPTOCOCCAL SORE THROAT, INC SCARLET FEVER 034	2	1	***	0.1	0.1	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	***	***	-	***
SYPHILIS 090-097	49	61	***	2.6	3.2	***	-	-	1	-	-	2.1	5	-	2	4.5	-	1.7	-	1	-	-	1.1	-	***	2	***	***	0.2	***
TETANUS 037	86	90	***	4.6	4.7	***	1	-	-	2.2	-	-	***	***	10	***	***	8.7	2	2	2	2.2	2.2	2.2	***	13	***	***	1.3	***
TRYPANOSOMIASIS, AMERICAN . 086	-	-	***	-	-	***	-	-	-	-	-	-	***	***	***	***	***	***	-	-	-	-	-	-	***	-	***	***	-	***
TUBERCULOSIS 010-018	63	66	***	3.4	3.5	***	-	1	5	-	0.4	10.4	19	5	17	17.3	4.5	14.8	4	1	7	4.5	1.3	7.7	***	56	***	***	5.4	***
TYPHOID FEVER 001	3	4	***	0.2	0.2	***	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1.1	-	***	-	***	***	-	***
TYPHUS, ENDEMIC FLEA, PERNI CP1.0	-	1	***	-	0.1	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	***	***	-	***
TYPHUS, EPIDEMIC LOUSE-PERNI CP0	-	-	***	-	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	***	***	-	***
WHOOPING COUGH 033	11	6	***	0.7	0.3	***	-	-	-	-	-	-	-	-	2	-	-	1.7	-	-	-	-	-	-	***	-	***	***	-	***
YELLOW FEVER 060	-	-	***	-	-	***	-	-	-	-	-	-	***	***	-	***	***	-	-	-	-	-	-	-	***	-	***	***	-	***

or have been present in the Commonwealth Caribbean. Cholera has not been reported in the Americas since 1911. Of the diseases under international surveillance (influenza, poliomyelitis, louse-borne relapsing fever, louse borne typhus and malaria) only influenza has been a serious problem in the past decade. Outbreaks in Barbados, Grenada, Jamaica and Trinidad have been reported from 1969 to 1973 and all were classified in the low to moderate incidence range.

Malaria

With regard to malaria eradication, Guyana has placed its entire territory in the consolidation and maintenance phases. Belize is the only area in the Commonwealth Caribbean where malaria is still classified in the attack phase.[1] Seventy-five thousand people or 52.8% of the population is affected by the attack phase with the remaining 41.4% of the population (53,000) classified as residing in a consolidation phase area. In Dominica 100% (14,000) of the popuation originally residing in a classified malarious area are now considered in the maintenance

[1]A malaria eradication program is divided into 4 phases: the prepatory phase characterized principally by geographic reconnaissa and training of staff. The attack phase during which total coverag house spraying or other attack methods are applied; the consolidati phase during which total coverage spraying has ceased and surveilla is carried out; and the maintenance phase from the time malaria is eradicated from the country.

TABLE B-1-1

REPORTED CASES OF NOTIFIABLE DISEASES WITH RATES PER 100,000 POPULATION, BY COUNTRY, 1970-1972

SOURCE: Reported Cases of Notifiable Diseases in the Americas; PAHO Pub. # 308

(A) REPORTING AREA, EXCEPT FOR LOUSE-BORNE TYPHUS AND PERU 1972. (B) REPORTING AREA. (C) INCOMPLETE DATA. (D) DATA REFER TO ST. KITTS-NEVIS ONLY.

COUNTRY	AMEBIASIS (0004)							ENCEPHALITIS, VIRAL (0062-0065,0068-71)							GONOCOCCAL INFECTIONS (0981)						
	1967-71	1970		1971		1972		1967-71	1970		1971		1972		1967-71	1970		1971		1972	
	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
ANTIGUA	---	---	---	---	---	1	1.4	-	---	---	-	-	A) -	-	---	---	---	168	240.0	617	845.2
ARGENTINA	1534	1532	6.6	---	---	---	---	478	121	1.6	691	2.9	---	---	9234	*10250	44.2	12591	53.2	17191	71.9
BAHAMAS	485	485	283.6	460	268.6	271	142.5	-	-	-	-	-	-	-	117	142	83.0	269	145.4	242	127.4
BARBADOS	-	-	-	*	---	*	---	---	*	---	*	---	*	---	---	*	---	*	---	*	---
BELIZE	11	9	7.5	7	5.6	1	0.8	-	---	---	1	0.8	A) 3	2.3	156	241	200.8	386	311.3	349	273.1
BERMUDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	255	505	979.7	517	989.5	781	1477.0
BOLIVIA (A)	---	---	---	706	33.2	* 762	34.9	2	2	0.1	2	0.1	* 4	0.2	238	1212	58.5	1935	91.2	* 1724	79.0
BRAZIL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CANADA	71	119	0.6	134	0.6	253	1.2	1	-	-	-	-	C) 8	0.0	27164	31544	148.0	34405	159.3	41467	189.8
CAYMAN ISLANDS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CHILE	152	179	1.8	192	1.9	156	1.4	54	66	0.7	57	0.5	A) 52	0.5	---	---	---	---	---	---	---
COLOMBIA	---	*	---	---	---	---	---	153	193	0.9	92	0.4	A) 90	0.4	43279	39778	188.4	36005	165.2	36960	164.3
COSTA RICA	---	*	---	---	---	445	24.1	6	6	0.3	12	0.7	10	0.5	2806	2806	161.5	5100	285.6	6998	379.7
CUBA	346	346	4.1	527	6.1	* 2625	30.0	53	35	0.4	11	0.2	A) 19	0.2	243	238	2.8	374	4.3	* 740	8.5
DOMINICA	53	42	59.2	4	5.6	* 184	252.1	-	-	-	* -	-	-	-	108	108	152.1	149	206.9	* 104	142.5
DOMINICAN REPUBLIC	---	---	---	---	---	---	---	---	-	-	---	---	-	-	10880	9786	240.9	5215	124.7	9664	224.5
ECUADOR	---	---	---	---	---	*	---	44	49	0.8	40	0.6	89	1.4	---	---	---	* 2853	45.3	5054	77.7
EL SALVADOR (A)	7383	*11886	395.4	4606	150.5	4422	140.2	---	---	---	---	--	-	-	5685	* 5779	194.2	9672	316.0	8174	259.2
FALKLAND ISLANDS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FRENCH GUIANA	---	---	---	2	3.9	---	---	-	-	-	1	5.9	D) * -	-	232	325	637.3	232	453.0	D) * 165	294.6
GRENADA	98	* 98	103.2	30	31.3	* 41	42.7	-	* -	-	-	-	* -	-	1518	* 1518	1597.9	1569	1634.4	* 2220	2312.5
GUADELOUPE	---	---	---	---	---	* -	-	---	---	---	---	---	-	-	---	---	---	---	---	2	0.6
GUATEMALA	3460	* 3460	67.8	* 2751	52.5	887	16.5	-	* -	-	-	-	-	-	4061	* 4696	92.1	* 4061	77.5	4820	89.4
GUYANA	---	*	---	---	---	-	-	---	*	---	-	-	-	-	---	*	---	---	---	*	---
HAITI	758	* 758	15.4	758	15.3	2140	42.7	-	* 37	0.8	102	2.1	A) 10	0.2	2234	* 2250	46.2	2219	44.7	1595	31.4
HONDURAS	4900	---	---	6835	259.4	7767	289.1	-	1	0.0	27	1.0	27	1.0	4787	4270	165.4	4892	185.7	4232	157.5
JAMAICA	-	-	-	4	0.2	1	0.1	-	-	-	-	-	2	0.1	37070	41723	2232.3	30740	1620.5	32785	1678.9
MARTINIQUE	---	---	---	---	---	---	---	---	*	---	* -	-	* -	-	---	*	---	-	-	* -	-
MEXICO	21445	22778	46.6	37937	74.9	47791	91.1	45	36	0.1	5019	9.9	3676	7.0	12522	11467	23.4	13325	26.3	14323	27.3
MONTSERRAT	---	---	---	---	---	* -	-	---	---	---	---	---	---	---	---	---	---	---	---	* 19	158.3
NETHERLANDS ANTILLES	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NICARAGUA	1439	---	---	---	---	B) 3542	178.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---
PANAMA	594	270	18.8	594	40.2	575	37.7	1	-	-	1	0.1	6	0.4	1842	* 2457	123.8	* 1842	92.7	1642	82.6
PANAMA CANAL ZONE	-	-	-	---	---	* -	-	-	-	-	---	---	-	-	1340	1547	107.8	2091	141.4	1558	102.3
PARAGUAY (A)	---	---	---	---	---	---	---	63	63	5.1	52	4.0	98	7.5	50	45	101.8	29	64.4	24	53.3
PERU (A)	1627	1413	20.8	856	12.0	* 909	6.3	52	49	0.7	111	1.6	A) 149	1.0	770	824	67.0	772	59.7	666	51.1
PUERTO RICO	-	-	-	-	-	-	-	1	1	0.0	1	0.0	A) 1	0.0	6942	7087	104.1	6466	90.6	5123	35.4
ST.KITTS-NEVIS-ANGUILLA (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2558	2347	86.2	1617	58.3	2532	88.7
ST. LUCIA	-	---	---	* 3	7.7	1	0.9	-	* -	-	* -	-	-	-	25	62	134.8	94	200.0	88	183.7
ST. PIERRE AND MIQUELON	---	---	---	---	---	---	---	---	---	---	---	---	---	---	467	* 835	759.1	* 867	774.1	628	546.1
ST. VINCENT	---	---	---	---	---	B)1	1.1	-	-	-	1	1.1	A) 5	5.5	---	---	---	---	---	---	---
SURINAM	13	* 13	3.3	13	3.2	16	3.8	---	---	---	---	---	---	---	---	---	---	426	473.3	479	526.4
TRINIDAD AND TOBAGO	13	* 12	1.2	13	1.3	* 145	13.9	2	* 2	0.2	6	0.6	-	-	---	*	---	---	---	---	---
TURKS AND CAICOS ISLANDS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	*9104	* 9363	912.0	8758	848.2	*10165	974.6
UNITED STATES	2915	2888	1.4	2752	1.3	2199	1.1	1580	1580	0.8	1524	0.7	1059	0.5	534872	600072	294.4	670268	325.0	767215	368.4
URUGUAY	1	2	0.1	1	0.0	1	0.0	26	28	0.8	26	0.9	A) 31	1.0	162	223	7.7	472	16.2	594	20.1
VENEZUELA (A)	17023	13194	185.1	11379	154.3	12609	148.8	482	582	6.8	100	1.4	90	1.1	33518	33518	470.2	33529	456.7	36038	425.2
VIRGIN ISLANDS (UK)	---	---	---	* 23	200.0	---	---	---	---	---	* -	-	---	---	---	---	---	* 86	781.8	---	---
VIRGIN ISLANDS (US)	---	---	---	---	---	---	---	---	---	---	* -	-	* -	-	---	---	---	---	---	* 291	434.3

TABLE B-1-1

EPOI CAS NO BLE SES RA ER 1(/POP ION,
BY COUNTRY, 1970-1972 (CONTINUED)

COUNTRY	MALARIA (084) (A)							POLIOMYELITIS, ACUTE (040-043)							SYPHILIS (090-097)						
	1967-71	1970		1971		1972		1967-71	1970		1971		1972		1967-71	1970		1971		1972	
	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
ANTIGUA	-	...	...	-	-	-	-	-	...	...	-	-	-	-	...	...	...	...	...	47	64.4
ARGENTINA	194	83	0.4	518	2.2	359	1.5	238	238	1.0	467	2.0	4	0.0	5719	* 5336	23.0	7298	31.0	11030	46.1
BAHAMAS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	204	204	119.3	1088	588.1	551	290.0
BARBADOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	...	*	...	*	...	*	...
BELIZE	33	33	27.5	33	26.6	86	67.3	-	...	...	-	-	2	1.6	42	42	35.0	82	66.1	331	259.0
BERMUDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	37	71.8	34	65.1	25	47.3
BOLIVIA (A)	4425	6862	139.2	8080	159.6	4275	82.3	20	111	5.4	34	1.6	* 49	2.2	271	1074	51.9	1059	49.8	* 1121	51.4
BRAZIL (B)	80294	54644	58.5	80294	83.6	85325	86.3	1826	* 2368	2.5	* 2067	2.3	* 1353	1.4	...	...	...	...	...	...	...
CANADA	5	5	0.0	7	0.0	7	0.0	2	C) 3	0.0	C) 4	0.0	C) 2	0.0	2395	2507	11.8	2489	11.5	3064	14.0
CAYMAN ISLANDS	...	-	-	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CHILE	-	...	...	...	...	...	...	64	205	2.1	55	0.6	11	0.1	3279	1464	15.1	3217	32.4	2982	29.5
COLOMBIA	27333	32272	152.8	22402	102.8	30997	137.8	465	C)793	3.8	465	2.1	427	1.9	15280	15399	72.9	13976	64.1	D) 18631	82.8
COSTA RICA	687	356	20.5	259	14.5	159	8.6	7	27	1.3	1	0.1	49	2.7	974	974	56.1	1497	83.8	1779	96.5
CUBA	4	E) 1	0.0	E) 7	0.1	E) 34	0.4	-	1	0.0	1	0.0	* -	-	619	619	7.3	969	11.3	* 2151	24.6
DOMINICA	-	-	-	-	-	-	-	-	-	-	-	-	* -	-	19	9	12.7	10	13.9	* 14	19.2
DOMINICAN REPUBLIC	127	161	4.0	277	6.6	261	6.1	38	9	0.2	67	1.6	5	0.1	7910	7720	190.1	7198	172.1	8004	186.0
ECUADOR	28529	28529	468.2	9176	145.7	6709	103.1	169	169	2.8	147	2.3	175	2.7	...	...	...	* 1402	22.3	2061	31.7
EL SALVADOR (A)	45436	45436	1285.7	46858	1284.8	38335	1019.5	72	C)* 80	2.7	72	2.4	71	2.3	8423	* 8423	283.0	9256	303.7	9729	308.5
FALKLAND ISLANDS	...	-	-	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
FRENCH GUIANA	82	117	229.4	112	218.7	192	342.9	-	-	-	-	-	D) * -	-	41	28	54.9	41	80.1	C) * 76	135.7
GRENADA	-	* -	-	-	-	* -	-	-	* 1	1.1	-	-	-	-	222	* 222	233.7	205	213.5	* 235	244.8
GUADELOUPE	-	...	...	-	-	-	-	1	* -	-	-	-	-	-	124	* 108	33.0	209	63.0	141	41.8
GUATEMALA	10969	11044	216.5	8280	158.0	7750	143.8	146	* 108	2.1	* 301	5.7	101	1.9	1385	* 1385	27.2	* 1613	30.8	2012	37.3
GUYANA	27	18	2.5	27	3.7	266	35.3	1	-	-	-	-	-	-	...	*	...	...	...	*	...
HAITI	10471	10658	219.0	11347	228.4	25961	511.7	3	* 3	0.1	41	0.8	5	0.1	2228	* 2310	47.5	1435	28.9	1650	32.5
HONDURAS	29584	34537	1337.6	48586	1843.9	18651	694.2	37	C) 20	0.8	33	1.3	66	2.5	2460	2922	109.3	2460	93.4	2303	85.7
JAMAICA	2	E) 2	0.1	-	-	E) 1	0.1	1	6	0.3	-	-	-	-	1505	1561	83.5	2657	140.1	2576	134.0
MARTINIQUE	-	* -	-	-	-	* -	-	-	* -	-	-	-	* -	-	996	...	...	29	8.5	* 2	0.6
MEXICO	42978	62586	127.9	42978	84.9	26216	50.0	679	2043	4.2	630	1.2	309	0.6	12246	10976	22.4	12246	24.2	11210	21.4
MONTSERRAT	...	...	...	...	...	...	...	...	...	...	...	...	* -	-	...	...	...	...	...	* 1	8.3
NETHERLANDS ANTILLES	...	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
NICARAGUA	16050	27260	1374.0	25303	1274.1	9595	482.6	154	* 9	0.5	* 203	10.2	D)48	2.4	1044	* 1477	74.4	* 1044	52.6	1634	82.2
PANAMA	4014	4807	335.1	1041	70.4	819	53.8	12	12	0.8	76	5.1	2	0.1	361	693	48.3	878	59.4	739	48.5
PANAMA CANAL ZONE	41	57	129.0	39	86.7	41	91.1	-	-	-	-	-	-	-	14	14	31.7	8	17.8	10	22.7
PARAGUAY (A)	10307	1429	59.9	423	17.2	94	3.6	106	C) 123	10.0	C) 141	10.9	C) 84	6.4	2016	2222	180.8	1986	153.5	1466	112.4
PERU (A)	3166	4546	33.5	4137	29.5	10036	69.4	160	160	2.4	124	1.7	* 144	1.0	2847	3256	47.8	3543	49.6	3329	23.0
PUERTO RICO	15	E) 36	1.3	E) 30	1.1	E) 5	0.2	-	-	-	-	-	-	-	2278	2278	83.7	1983	71.5	2164	75.7
ST.KITTS-NEVIS-ANGUILLA (B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	56	121.7	45	95.7	50	104.4
ST. LUCIA	-	* -	-	* -	-	1	0.9	1	* -	-	* 1	0.9	-	-	285	* 285	259.1	* 435	392.0	495	430.4
ST. PIERRE AND MIQUELON	...	-	-	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ST. VINCENT	...	-	-	...	...	-	-	...	-	-	...	...	D) 44	48.4	...	...	...	25	27.8	54	59.3
SURINAM	1546	1019	259.3	1546	380.8	800	190.9	-	* -	-	-	-	-	-	...	*	...	...	...	...	...
TRINIDAD AND TOBAGO	3	1	0.1	G) 3	0.3	G) 2	0.2	3	* 3	0.3	46	4.5	* 140	13.4	541	* 467	45.5	541	52.4	* 681	65.1
TURKS AND CAICOS ISLANDS	...	-	-	...	...	...	...	...	...	...	...	...	-	-	...	...	...	...	...	...	...
UNITED STATES	2375	3051	1.5	2375	1.2	742	0.4	31	31	0.0	21	0.0	31	0.0	95997	91382	44.8	95997	46.6	91149	43.8
URUGUAY	-	E) 1	0.0	-	-	E) 1	0.0	6	5	0.2	2	0.1	2	0.1	316	302	10.5	539	18.5	434	14.7
VENEZUELA (A)	8740	15288	156.1	22895	213.5	18062	165.4	124	124	1.7	377	5.1	80	0.9	11158	11158	156.5	12951	176.4	14184	167.4
VIRGIN ISLANDS (UK)	...	...	...	* -	-	...	...	...	...	...	* -	-	...	...	...	...	...	* -	-	...	...
VIRGIN ISLANDS (US)	...	-	-	* -	-	* -	-	...	...	...	* -	-	* -	-	...	...	...	F) * 30	46.2	* 88	131.1

257 b

not available

TABLE B-1-1

REPORTED CASES OF NOTIFIABLE DISEASES WITH RATES PER 100,000 POPULATION, BY COUNTRY, 1970-1972 (CONTINUED)

COUNTRY	TETANUS (037)							TUBERCULOSES (010-019)							TYPHOID FEVER (001)						
	1967-71	1970		1971		1972		1967-71	1970		1971		1972		1967-71	1970		1971		1972	
	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
ANTIGUA	...	...	...	5	7.1	-	-	-	...	...	2	2.9	1	1.4	...	...	...	...	...	-	-
ARGENTINA	382	• 382	1.6	336	1.4	341	1.4	18637	•18637	80.3	18681	79.3	16248	67.9	1245	1356	5.8	1369	5.8	1095	4.6
BAHAMAS	7	1	0.6	5	1.6	-	-	127	135	78.9	77	41.6	82	43.2	5	6	3.5	5	2.7	3	1.6
BARBADOS	...	8	3.4	21	8.8	12	5.0	21	22	9.3	27	11.3	13	5.4	17	9	3.8	4	1.7	7	2.9
BELIZE	3	1	0.8	6	4.8	3	2.3	51	43	35.8	A) 29	23.4	27	21.1	5	2	1.7	5	4.0	B) 3	2.3
BERMUDA	-	-	-	-	-	-	-	9	9	17.5	9	17.2	A)10	18.9	1	1	1.9	2	3.8	-	-
BOLIVIA (A)	...	...	...	58	2.7	• 26	1.2	2947	9025	435.8	9752	458.7	• 9029	413.8	212	427	20.6	700	32.9	• 531	24.3
BRAZIL (B)	2524	• 2501	2.7	• 1962	2.2	• 2051	2.1	37854	•36510	39.1	•36265	37.7	•36312	36.7	3522	• 3722	4.0	• 3672	4.0	• 4292	4.4
CANADA	9	11	0.1	6	0.0	3	0.0	4438	3920	18.4	3943	18.3	3909	17.9	93	51	0.2	99	0.5	102	0.5
CAYMAN ISLANDS	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CHILE	35	25	0.3	41	0.4	30	0.3	...	...	...	...	...	...	...	5344	5344	54.9	4784	48.2	4527	44.7
COLOMBIA	587	579	2.7	587	2.7	520	2.3	18319	22026	104.3	19620	90.0	19272	85.7	7055	7055	33.4	7383	33.9	8965	39.9
COSTA RICA	71	87	5.0	71	4.0	82	4.4	405	401	23.1	405	22.7	394	21.4	71	60	3.5	55	3.1	59	3.2
CUBA	291	223	2.6	174	2.0	• 151	1.7	2950	2606	30.8	1543	17.9	• 1270	14.5	415	415	4.9	414	4.8	• 448	5.1
DOMINICA	1	1	1.4	-	-	• 5	6.8	58	21	29.6	58	80.6	• 14	19.2	64	64	90.1	• 64	88.9	• 47	64.4
DOMINICAN REPUBLIC	254	317	7.8	141	3.4	111	2.6	627	627	15.4	A) 483	11.6	1559	36.2	886	886	21.8	370	8.8	1198	27.8
ECUADOR	...	...	...	...	...	•	...	3506	3499	57.4	3506	55.7	F) 1650	25.4	2137	2137	35.1	2011	31.9	2604	40.0
EL SALVADOR (A)	230	• 235	7.9	201	6.6	188	6.0	4424	• 4552	153.0	A) 4418	144.3	A) 3889	123.3	135	• 294	9.9	439	14.3	804	25.5
FALKLAND ISLANDS	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
FRENCH GUIANA	1	-	-	1	5.9	C) • 2	3.6	10	-	-	A) 56	109.3	F) • 41	73.2	5	2	3.9	B) 7	13.7	3	5.4
GRENADA	4	• 2	2.1	4	4.2	• 1	1.0	14	• 14	14.7	11	11.5	• 5	5.2	5	• -	-	B) 82	85.4	• 5	5.2
GUADELOUPE	13	• 17	5.2	7	2.1	2	0.6	181	• 182	55.7	138	41.6	81	24.0	5	• 3	0.9	7	2.1	4	1.2
GUATEMALA	...	...	...	...	...	86	1.6	3506	• 3506	68.7	• 3360	64.1	5962	110.6	647	• 647	12.7	• 589	11.2	130	2.4
GUYANA	...	•	...	...	...	...	...	196	183	25.5	• 196	26.6	133	17.6	351	157	21.9	5	0.7	510	67.6
HAITI	666	• 666	13.7	616	12.4	384	7.6	2251	• 1964	40.4	• 2220	44.7	3038	59.9	644	• 441	9.1	644	13.0	899	17.7
HONDURAS	20	178	6.5	19	0.6	19	0.7	1803	1631	63.2	1803	68.4	2142	79.7	679	544	21.1	366	13.9	371	13.8
JAMAICA	91	91	4.5	68	3.6	72	3.7	329	329	17.6	252	13.3	368	19.1	67	67	3.6	62	3.3	99	5.1
MARTINIQUE	7	• 5	2.7	5	1.5	• 3	0.9	108	• 88	26.0	89	26.1	• 48	14.0	14	• 14	4.1	14	4.1	• 25	7.3
MEXICO	721	578	1.2	651	1.1	619	1.2	15424	16185	33.1	18876	37.3	18135	34.6	2986	2802	5.7	3474	6.9	7645	14.6
MONTSERRAT	...	...	...	...	...	• -	-	...	...	...	...	...	...	...	...	...	...	...	...	• -	-
NETHERLANDS ANTILLES	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
NICARAGUA	16	• 15	0.8	• 4	0.2	94	4.7	1723	• 1970	99.3	• 1723	86.8	1409	70.9	174	• 174	8.8	• 182	9.2	F) 257	12.9
PANAMA	87	58	4.0	87	5.9	31	2.0	1375	1375	95.9	2190	148.1	1834	120.4	9	5	0.3	32	2.2	15	1.0
PANAMA CANAL ZONE	...	...	...	...	...	...	...	16	13	29.4	16	35.6	A) 7	15.6	-	-	-	-	-	1	2.2
PARAGUAY (A)	239	298	24.2	138	10.7	233	17.9	1506	1703	138.6	2001	154.6	1344	103.1	98	76	6.2	B) 58	4.5	B) 51	3.9
PERU (A)	249	303	4.5	263	3.7	289	2.0	18489	21579	317.0	21399	299.8	21324	147.5	6117	6234	91.6	B)6231	87.3	C)6524	45.1
PUERTO RICO	25	14	0.5	29	1.0	16	0.6	808	790	29.0	808	29.1	644	23.5	8	7	0.3	7	0.3	B) 7	0.2
ST. KITTS-NEVIS-ANGUILLA (D)	2	3	6.5	1	2.1	-	-	(G) 13	A) 12	26.1	A) 11	23.4	18	37.6	-	-	-	-	-	-	-
ST. LUCIA	...	...	...	...	...	9	7.8	49	• 17	15.5	• 48	42.9	74	64.3	24	• 2	1.8	• 58	51.8	38	33.0
ST. PIERRE AND MIQUELON	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ST. VINCENT	10	10	11.2	C) 3	3.3	C) 8	8.8	12	12	13.5	F) 6	6.7	A,F)2	2.2	...	...	...	...	...	F) 12	13.2
SURINAM	...	...	...	...	...	•	...	118	• 119	30.0	100	24.6	99	23.6	20	• 9	2.3	20	4.9	9	2.1
TRINIDAD AND TOBAGO	28	• 28	2.7	26	2.5	• 28	2.7	102	• 102	9.9	100	9.7	• 116	11.1	69	• 56	5.5	139	13.5	• 30	2.9
TURKS AND CAICOS ISLANDS	...	...	...	...	...	-	-	...	...	...	...	...	5	83.3	...	...	...	...	...	-	-
UNITED STATES	178	148	0.1	116	0.1	128	0.1	39120	37137	18.2	35217	17.1	32882	15.8	395	346	0.2	407	0.2	398	0.2
URUGUAY	51	33	1.1	25	0.9	28	0.9	1140	1107	38.4	1140	39.0	1550	52.4	173	169	5.9	152	5.2	104	3.5
VENEZUELA (A)	1008	1000	14.0	858	11.7	761	9.0	4911	6170	86.4	5249	72.2	5395	63.7	200	200	2.8	148	2.0	119	1.4
VIRGIN ISLANDS (UK)	...	...	...	...	...	...	...	...	...	...	A) • 1	9.1	...	...	...	...	...	• -	-	...	...
VIRGIN ISLANDS (US)	...	...	...	• -	-	• -	-	...	...	...	...	...	• 12	17.9	...	...	...	• 1	1.5	• -	-

TABLE B-1-1

REPORTED CASES OF NOTIFIABLE DISEASES WITH RATES PER 100,000 POPULATION, BY COUNTRY, 1970-1972 (CONTINUED)

COUNTRY	WHOOPING COUGH (033)							YAWS (102)						
	1967-71	1970		1971		1972		1967-71	1970		1971		1972	
	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	MEDIAN	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
ANTIGUA	41	---	---	41	58.6	135	189.9	---	---	---	-	-	9	12.1
ARGENTINA	22979	14795	61.7	23511	95.8	39335	164.4	---	•	---	•	---	•	---
BAHAMAS	4	-	-	-	-	-	-	-	-	-	-	-	-	-
BARBADOS	---	7	2.9	150	62.8	---	---	---	-	-	-	-	-	-
BELIZE	46	46	38.3	213	171.8	23	18.0	-	-	-	-	-	-	-
BERMUDA	3	3	5.8	6	11.5	2	3.8	-	-	-	-	-	-	-
BOLIVIA (A)	977	2262	109.2	2108	99.2	2476	113.5	---	---	---	-	-	• -	-
BRAZIL	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CANADA	2505	2058	9.8	3002	13.9	1297	5.9	---	•	---	•	---	•	---
CAYMAN ISLANDS	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CHILE	2074	2392	24.6	2074	20.9	3380	33.4	---	---	---	---	---	---	---
COLOMBIA	15786	12391	58.6	15786	72.4	17403	77.4	34	34	0.2	18	0.1	67	0.3
COSTA RICA	1233	1233	71.0	1416	79.3	1427	77.4	---	•	---	---	---	-	-
CUBA	801	1192	14.1	361	4.2	• 1268	14.5	---	•	---	-	-	---	---
DOMINICA	1	1	1.4	1687	2343.1	• 1	1.4	128	353	497.2	351	487.5	• 206	282.2
DOMINICAN REPUBLIC	2864	2551	62.8	1655	39.6	3132	72.8	7	2	0.0	9	0.2	1	0.0
ECUADOR	---	---	---	---	---	1830	28.1	611	645	10.6	437	6.9	380	5.8
EL SALVADOR (A)	3733	• 4002	134.5	4231	138.2	2996	95.0	---	---	---	•	---	---	---
FALKLAND ISLANDS	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FRENCH GUIANA	1	-	-	2	3.9	(C) • 3	5.4	---	---	---	-	-	• -	-
GRENADA	304	• 818	861.1	174	181.3	9	9.4	18	• 18	18.9	-	-	3	3.1
GUADELOUPE	7	• 2	0.6	51	15.4	-	-	---	---	---	---	---	-	-
GUATEMALA	2080	• 2080	40.8	• 2063	39.4	687	12.7	---	• 1	0.0	-	-	• -	-
GUYANA	---	•	---	•	---	287	38.1	---	•	---	---	---	• -	-
HAITI	1563	• 777	16.0	1759	35.4	1963	38.7	59	• 32	0.7	123	2.5	14	0.3
HONDURAS	2174	2174	94.2	3035	115.2	1892	70.4	---	•	---	•	---	-	-
JAMAICA	476	476	20.1	264	13.9	133	6.9	4	3	0.2	1	0.1	62	3.2
MARTINIQUE	1	• 5	1.5	-	-	• -	-	---	---	---	---	---	---	---
MEXICO	24016	17354	35.5	29772	58.8	21902	41.8	-	-	-	-	-	-	-
MONTSERRAT	---	---	---	---	---	• -	-	---	---	---	---	---	• -	-
NETHERLANDS ANTILLES	---	•	---	---	---	---	---	---	•	---	---	---	---	---
NICARAGUA	619	• 396	20.0	• 818	41.2	1082	54.4	---	---	---	---	---	---	---
PANAMA	689	166	11.6	904	61.2	1597	104.8	-	-	-	-	-	-	-
PANAMA CANAL ZONE	-	-	-	-	-	-	-	-	-	-	---	---	-	-
PARAGUAY (A)	1272	1315	107.0	1243	96.1	1101	84.4	---	---	---	-	-	-	-
PERU (A)	13849	8629	126.7	13849	194.0	•10210	70.6	25	25	0.4	23	0.3	3	0.0
PUERTO RICO	100	100	3.7	104	3.7	93	3.3	-	-	-	---	---	•	---
ST.KITTS-NEVIS-ANGUILLA (	-	-	-	-	-	67	139.9	3) -	-	-	-	-	-	-
ST. LUCIA	10	• -	-	• 31	27.7	172	149.6	5	• 8	7.3	• 26	23.7	10	8.7
ST. PIERRE AND MIQUELON	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ST. VINCENT	---	---	---	(C) 31	34.4	(C)5	5.5	---	---	---	(C) 40	44.4	(C) 96	105.5
SURINAM	---	•	---	---	---	---	---	---	---	---	---	---	---	---
TRINIDAD AND TOBAGO	227	• 210	20.5	57	5.5	• 111	10.6	72	• 143	13.9	273	26.4	• 383	36.7
TURKS AND CAICOS ISLANDS	---	---	---	---	---	-	-	---	---	---	---	---	---	---
UNITED STATES	4249	4249	2.1	3036	1.5	3287	1.6	---	•	---	•	---	•	---
URUGUAY	121	54	1.9	121	4.1	90	3.0	---	•	---	•	---	•	---
VENEZUELA (A)	9468	8652	121.9	9239	125.8	13319	157.2	-	-	-	-	-	-	-
VIRGIN ISLANDS (UK)	---	---	---	• 24	218.2	---	---	---	---	---	• -	-	---	---
VIRGIN ISLANDS (US)	---	---	---	---	---	---	---	---	•	---	---	---	---	---

contaminated water supplies and vectors. It has had a high incidence recently in Dominica, Grenada, and Trinidad and Tobago. The disease can often by prevented and controlled through improvement of the living environment and environmental sanitation.

Diptheria

Diptheria has shown consistently high incidence in Barbados, Dominica, and Trinidad and Tobago. It is an acute infectious disease usually transmitted from contact with an infected patient, carrier or soiled articles. The only effective control is by active immunization with a diptheria toxoid on a population-wide basis.

Bacillary Dysentery

Bacillary dysentery has shown high incidence in Belize, Dominica, Grenada, Guyana, St. Lucia, and St. Vincent. One would expect that incidence is also high in many of the countries for which figures are not available such as the Cayman Islands, Montserrat, and the Turks and Caicos Islands. The disease is transmitted by direct or indirect fecal-oral transmission from a patient or carrier. Improved environmental sanitation and health education of personal hygiene and sanitation are necessary for control of the disease.

Gonococcal Infections

The incidence of gonococcal infections is high in the Commonwealth Caribbean. It is important to note that the rate of gonococcal infections is probably much higher than the number of reported cases indicated in Table III-3. In Grenada the rate indicates 2 cases of gonorrhea for every 100 persons, in Jamaica 1.6 cases per 100 population, .97 cases in Trinidad and .84 cases in Antigua. Estimates in the U.S. indicate that 3 times as many cases are reported as reported. Such rates indicate a serious health problem. Since the disease is always transmitted through contact with the exudates from the mucous membranes of infected persons the preventive measures include health and sex education as well as the provision of facilities for treatment. Proper investigation of contacts and follow-up is essential in control of the disease.

Infectious Hepatitis

The incidence of infectious hepatitis is high in several countries of the Caribbean notably Belize, Grenada, St. Kitts, and St. Vincent. The disease is transmitted person-to-person by the fecal-oral route through contamination of intermediate vehicles such as food and water. Again, good personal hygiene as well as sterilization of medical equipment and prophylactic doses of immune serum golbulin are the indicated preventive measures.

Leprosy

While leprosy is not a severe health problem in the Commonwealth Caribbean sporadic cases and moderate incidence are reported in several countries; Grenada, Guyana, and Trinidad specifically. Health education, dapsone, and BCG immunizations have been shown to be effective in the prevention of leprosy.

Tetanus

The incidence of tetanus in the Caribbean is moderate with the highest rate of cases being reported in St. Vincent, St. Lucia, and Dominica. The tetanus toxiod immunization is the best preventive measure. Recent tests find that immunization can be effective for as long as ten years. The resevoir of the disease is in the soil and intestinal canals of animals in which the organism is a harmless inhabitant. It is introduced into the body by means of direct contact with the contaminated soil or feces after a puncture wound or cut.

Tuberculosis

While tuberculosis incidence in the Caribbean is not as high as in other areas of Latin America moderately high incidence is seen in St. Kitts, Jamaica, Guyana, Belize and Trinidad. High incidence rates are reported in St. Lucia and St. Vincent. Incidence rates can indicate poor social conditions and low levels of adequate medical care. Periodic screening, BCG immunization and the availability of facilities for the treatment

and diagnosis of the disease are recommended measures for prevention. Since the highest susceptibility to the disease is in children under 3 years of age, and malnourished individuals with low resistance capability, BCG vaccination is generally indicated for these groups.

Typhoid Fever

High rates of typhoid fever incidence are seen in several areas, specifically Guyana, Dominica, and St. Lucia. This disease is transmitted through contaminated food or water. High incidence rates indicate generally poor levels of environmental sanitation particularly excreta disposal. Preventive measures include protection, purification, and chlorination of public water supplies; fly and vector control; identification of carriers; and health education.

Syphylis

Like gonococcal infections high levels of syphylis incidence are reported in the Caribbean. Although the incidence is not as high as with gonococcal infections the symptoms of syphylis can be more difficult to detect as latency can last from weeks to years. General health promotional measures, control of prostitution and discouragement of sexual promiscuity and provision of facilities for early diagnosis and treatment are all important factors in the prevention of any venereal disease.

Proper investigation of contacts and follow-up is also essential.

Venereal diseases are a particularly difficult communicable disease problem in the Caribbean due to the socio-cultural structure. Interviewing of patients and tracing of contacts is difficult at best in cultures as mobile as these.

Whooping Cough

Very high incidence of whooping cough have been reported in the Commonwealth Caribbean, especially St. Kitts, St. Lucia, and Antigua. These countries have three of the four highest incidence rates in Latin America. The disease is an acute infectious bacterial disease which has had a low mortality rate in the past two decades. The disease can be prevented by active immunization with a vaccine of killed bacteria and aluminum salts. It is most often administered as a series of three vaccines for diptheria, tetanus toxoids and pertussis (whooping cough), DPT.

Yaws

The incidence of yaws in Latin America is very low other than in the Commonwealth Caribbean. St. Vincent, Trinidad and Tobago, and Antigua all have a relatively large number of cases each year. Dominica, with a rate of 282.2 per 100,000 population is the highest rate in Latin America. The next closest is St. Vincent with an incidence of about 1/2 as many cases.

Yaws is an acute enteric disease caused by infectious agents of diverse serotypes. Although neither the reservoir nor the mode of transmission has been conclusively established it is suspected that the disease is transmitted by the fecal-oral route from an animal resevoir (dogs, cats, monkeys, birds, etc.). Preventive measures include sanitary disposal of human and dog feces, protection of the water supply, health education regarding personal hygiene, and sanitary preparation of food especially those consumed raw.

OTHER NOTIFIABLE DISEASES

Among the other communicable disease that affect the Commonwealth Caribbean are:

a) Encephalitis (Belize, Jamaica, St. Vincent)

b) Measles (All West Indies)

c) Mumps (Belize, Dominica, Guyana, Jamaica, St. Lucia)

d) Rabies (Belize, Grenada)

e) Streptococcal Sore Throat and Scarlet Fever (St. Vincent, Trinidad and Tobago)

f) Dengue (British Virgin Islands, Jamaica)

g) Leptospirosis (Barbados, Dominica, Jamaica, St. Vincent Trinidad and Togago)

h) Schistosomiasis (St. Lucia)

and i) Trichiniasis (St. Vincent)

Of these diseases high incidence rates were reported for measles in Belize and St. Lucia; for mumps in Belize and Dominica; for rabies in Belize (1970); for scarlet fever in St. Vincent and Trinidad; for dengue in the British Virgin Islands (1971); for leptospirosis in Barbados; for schistosomiasis in St. Lucia and trichiniasis in St. Vincent.

Of particular note are the schistosomiasis in St. Lucia and trichiniasis in St. Vincent which outbreaks could be considered epidemic in nature.

Plan for Caribbean Epidemiological Surveillance

The purpose of epidemiological surveillance according to Resolution 19 of the Caribbean Health Ministers Conference is "to have up-to-date information on the disease situation and conditioning factors together with interpretation, utilization and dissimination of these data." Until the formation of the Caribbean Epidemiology Center (CAREC) no means for such a system existed. Prior to its formation the responsibility lay with the individual countries to provide epidemiological surveillance. Responsibility for developing and maintaining a national surveillance system still must remain with the individual country as well as support of the regional surveillance systems. Such a system must be consistent with prevailing global and continental

surveillance.

In the planning for CAREC it was decided by the health ministers that initial surveillance should be limited to a number of important diseses - prevalent and preventible - that could be managed through existing facilities. These facilities could be improved as the need arose rather than beginning with an overly ambitious program where resources and personnel were not available.

Two levels of surveillance are implied through a regional epidemiology center; one is national surveillance the other international. Each country is responsible for operating and maintaning basic surveillance facilities. Within each country the epidemiological surveillance program should exist within the existing health service so that collection and retention of data can be coordinated with the MCH, medical care, sanitation, malaria and Aedes eradciation programs. According to the CMRH plan a unit should be established in every country that would collect process and disseminate information weekly. The International Surveillance center (CAREC) collects data from the participating countries, analyzes the data and prepares summary reports for distribution.

Each country should develop surveillance through all or some of the following elements:

1) Mortality registration;

2) Morbidity reporting;

3) Laboratory investigation;

4) Individual case and epidemic field investigations;

5) Surveys;

6) Animal resevoir and insect vector distribution studies;

7) Utilization of biologies and other drugs;

8) Knowledge of the population and environment.

The central Caribbean Surveillance Center has been located at the Trinidad Regional Virus Laboratory. The activities of this central facility are to provide epidemiologists for regular technical assistance sessions in the participating countries; 2) provide a central Caribbean Laboratory with supporting staff in bacteriology, virology, parisitology, and serology; 3) to assist in surveillance programs and reporting through data analysis and distribution (epidemiologic and demographic); and, 4) provide for communcation and shipment of specimens. Training of adequate personnel and support of national epidemiologic and laboratory services is also seeen as fundamental to the continued success of teh Regional Epidemiological Centre.

4. POPULATION AND DEMOGRAPHY

The demographic characteristics of the Caribbean Commonwealth region are inextricably linked to the other sectors of the region. Health, education, agriculture and manpower supply, all affect or are affected by the nature of the population and by migration. Thus, in considering any development assistance in this area it is absolutely necessary to understand these factors and the ramifications they hold for balanced development.

Population size varies considerably from country to country within the study area. For the region as a whole, it is about 4,038,000, however, Jamaica accounts for roughly 44% of this figure, whereas Monserrat is only 0.2% of the total. See Table 1.1

Mortality and fertility have a partial role in the determination of this population size, however, as will be seen later, other factors such as outmigration and cultural practices play an important part in the determination of population size and growth rates.

Density for the area as a whole is about 47 persons per square mile, however, as in the case of population, the disparity between the islands is immense. Guyana is the least densely

Table 1.1: ESTIMATED TOTAL POPULATION
AREA AND DENSITY OF POPULATION, BY COUNTRIES, 1974

Country	Total population	Per cent distribution	Area in sq. miles	Per cent distribution	Density (persons per sq. mile)
Jamaica	2,017,191	43.5	4,410	4.4	457
Trinidad and Tobago	985,828	21.2	1,980	2.0	498
Guyana	768,242	16.6	83,000	83.3	9
Barbados	237,193	5.1	166	0.2	1,429
Windward islands	370,853	8.0	821	0.8	452
St. Lucia	106,362	2.3	233	0.2	456
Grenada	97,393	2.1	133	0.1	732
St. Vincent	91,796	2.0	150	0.2	612
Dominica	75,302	1.6	305	0.3	247
Leeward islands	137,180	2.9	362	0.4	379
Antigua	70,000	1.5	170	0.2	412
St. Kitts-Nevis	44,311	0.9	101	0.1	439
Montserrat	12,057	0.2	32	0.0	377
Belize	132,456	2.8	8,866	8.9	15
All countries	4,638,131	100	99,546	100	47

Source: Mission Estimates

populated of the area with nine persons per square mile, while occupying about 80% of the total area. Barbados at the other extreme, has a density of almost 1,400 per square mile. These cases are somewhat extreme though as the other islands have a more strictured range of 350-750 persons per square mile.

Population growth for the region is quite low relative to other developing countries and the rate of growth is declining. An overall rate of 1.4% is observed for the area but Guyana and Belize top the charts with rates of over 2%, roughly comparable to the average for Latin America. Barbados, Grenada, St. Kitts, St. Vincent and Montserrat all recorded rates of less than 1%. Growth rates in the under 15 and over 55 population grew considerably faster than that of the 15 to 55 group. This has resulted in the rather unique age composition of the region. Those persons under 15 comprise approximately 46%, whereas those over 65 years of age are 4% of the total population, resulting in a dependency ratio of 1,032 dependents per 1,000 adults. This dependency ratio has been increasing as evidenced by the 11% increase over the decade of 1960-70. Furthermore, it is much higher than would be expected given the prevailing fertility rates.

Factors Affecting Population Growth

1. Fertility

The Crude Birth Rate has been declining in the region as a whole for several years due to the falling fertility rate. The Gross Reproductive Rate (GRR) declined by 15% between 1960-70 from 2.8 to 2.4. During the same period, the Crude Birth Rate fell from 41 to 32, mainly during the last half of the decade. Even though there is variation between the countries, most of them experienced some decline including those with notably high rates in the beginning. In the Windward Islands and Jamaica, there was a remarkable decline in the CBR but no corresponding drop in fertility rates.

2. Mortality

Mortality rates of the region are very low and comparable to those of developed countries. The Commonwealth Caribbean has a Crude Death Rate of eight compared with about nine in developed countries. Life expectancy is about 67 compared with 71 for more developed countries. Again variation between the countries exists with Barbados, Jamaica and Trinidad and Tobago having the best health conditions and the Windward Islands having relatively the worst. Between 1960 and 1970, life expectancy increased by four years and the CDR decreased by two points.

3. Migration

Perhaps one of the most important factors governing the low and widely varying rates of growth is the differential emigration

from the countries. During the 1960's, there was a net loss of roughly 598,000 persons from the region attributable to this factor. This is about one half the natural increase of 1,180,000 and the expected growth rate of 2.8% a year was reduced to 1.4% as a direct result of outmigration. Between 1946-60 and 1960-70, net migration for the area more than doubled. In fact, both Guyana and Trinidad and Tobago which were net immigrating countries during the first period, became net emigrating countries during the sixties. As with the other factors, wide variation exists between the countries.

Internal migration is another phenomenon with implications for growth or, more precisely, the distribution of growth geographically. The urban population, for the area as a whole, is pegged around 1,220,000 or 28% of the population. During the sixties, the urban centers increased their populations by 463,000 persons, a rate of growth of about 4.9% per year. The proportion of the urban population increased from 20% to 28%. When the growth rate of urban population is compared to the overall growth rate of the population, it is readily ascertainable that there is an excess of 3.5%.

Diversity is once again great between the countries, rangeing from a staggering urban growth rate of 6.3% in Jamaica during the sixties, to a net urban loss of 28,000 and 2,700 in

Trinidad and Tobago and Barbados respectively. Guyana's urban population increased by two and a half times between 1960 and 1970, although the statistic is not quite as spectacular as for Jamaica due to an initial low urban population.

While net outmigration is improving the overpopulation situation to a certain degree, it reduces that part of the labor force that is most integral to economic and industrial development, the educated and more highly trained personnel. Furthermore, as in Barbados, half a century's emigration in no way impaired the capacity of the population to reproduce itself within 40 years. So while emigration may prove to be a limiting factor on population growth, it is a mixed blessing at best since the emigration is both selective (biased) and ephemeral. This does not portend well for the future if migration rates slow (and it seems they must) and fertility does not fall.

Of the three factors affecting population growth, mortality plays the least crucial role in the determination of population growth, mortality plays the least crucial role in the determination of population growth for the region. As noted above, the mortality rate is very low and even if a decline in age specific death rates occurred due to improved health conditions, the effect would be nullified by an increase in the proportion of older persons. Fertility is a critical factor in

the growth rate of the area. However, it is so intertwined with migration that one is hesitant to make assumptions based on this factor solely. Suffice it to say that the rate of natural increase given current fertility, would result in an intolerable situation for most of the countries were it not for the mitigating nature of emigration.

Thus far, the discussion has centered mainly on an assessment of the population situation. More significant perhaps, are the future trands of population growth given the equivocal nature of the migration factor. As noted, emigration has had the effect of reducing natural increase by about fifty percent. It is extremely difficult to predict the future as regards migration trends, but it is safe to say that any change in this pivotal factor will result in more drastic alteration of the demographic picture than marginal changes in mortality or fertility. Within the context of this uncertainty, three possible alternatives are offered in Table 1. 2. The first, assuming no migration during the seventies, incidates an increase in total population from 1970 of 4,310,000 to 4,880,000 in 1975, to 5,564,000 in 1980 and to 6,354,000 in 1985. This assumption, however, is not very realistic, but it does point to the severe situation that could develop in the absence of mirgation and family planning. The third projection which assumes current

Table 1. 2: ESTIMATED FUTURE POPULATION OF CARIBBEAN COUNTRIES 1970-1985

Country	1970	1975 Projection I	1975 Projection II	1975 Projection III	1980 Projection I	1980 Projection II	1980 Projection III	1985 Projection I	1985 Projection II	1985 Projection III
Jamaica	1,854,300	2,124,368	2,036,247	1,977,500	2,448,128	2,251,590	2,120,564	2,827,952	2,511,548	2,300,611
Trinidad	931,071	1,035,555	992,308	970,684	1,153,766	1,062,450	1,016,793	1,281,134	1,152,078	1,068,608
Guyana	699,848	803,784	786,843	775,441	925,954	889,690	864,951	1,063,718	1,007,044	968,187
Barbados	235,229	248,939	237,893	229,601	266,374	242,652	224,850	286,250	253,114	220,698
St. Lucia	99,806	114,160	108,151	105,147	132,239	118,701	111,932	154,364	132,538	121,626
Grenada	92,775	104,755	98,800	95,823	121,294	107,981	101,324	141,195	119,875	109,215
St. Vincent	86,314	99,436	93,339	84,242	116,716	102,847	88,978	138,164	115,665	93,167
Dominica	69,549	79,975	76,900	73,824	93,277	86,251	79,224	109,626	98,202	86,778
Antigua /1	65,000/1	71,000	68,000	--	79,000	73,000	--	88,000	78,000	
St. Kitts	44,885	47,106	44,271	--	51,082	44,913	--	56,499	46,760	--
Montserrat	11,358	12,266	12,266	--	13,533	13,533	--	15,088	15,088	--
Belize	119,934	138,889	135,935	132,989	162,758	156,145	149,552	191,732	181,145	170,558
	4,310,069	4,880,233	4,690,953	4,569,788	5,504,101	5,149,753	4,889,614	6,353,722	5,711,057	5,279,296

ASSUMPTIONS INVOLVED IN THE PROJECTIONS

Country	Fertility (TFR) 1970	Fertility (TFR) 1985	Mortality (e_0^o) 1970	Mortality (e_0^o) 1985	Migration (annual 1970-1985) I	Migration (annual 1970-1985) II	Migration (annual 1970-1985) III
Jamaica	5.535	4.063	68.0	71.0	0	-15,000	-25,000
Trinidad	3.710	2.708	68.7	71.7	0	- 8,000	-12,000
Guyana	5.010	3.600	65.5	69.5	0	- 3,000	- 5,000
Barbados	2.770	2.375	68.4	71.3	0	- 2,000	- 3,500
St. Lucia	6.215	4.755	60.3	64.8	0	- 1,000	- 1,500
Grenada	4.915	3,760	66.7	71.1	0	- 1,000	- 1,500
St. Vincent	6.200	4,743	62.8	67.3	0	- 1,000	- 2,000
Dominica	6.545	5.007	61.7	66.2	0	- 500	- 1,000
Antigua							
St. Kitts	3.635	2.781	63.6	68.1	0	- 500	--
Montserrat	4.755	3.637	63.6	68.1	0	0	--
Belize	6.245	4.777	65.5	70.0	0	- 500	- 1,000

1/ Approximate estimates.

migration levels shows the total population to be 5,279,000 in 1985, 1,000,000 persons less than the first projection. A more probable estimate is the second projection which assumes reduction in net emigration. By 1985, the increase of population would be about 1,401,000 for an average growth rate of 1.9.

Within the context of Latin America, the Caribbean growth rate is relatively low. However, the growth rate may increase due to the possible reduction in emigration and the high growth rate of women in young reproductive ages. More important than the total growth rate is the differential growth of the various age groups. Table 1.5 shows the pattern for the sixties and the seventies. In the seventies the population is expected to increase by 831,000 (under the reduced migration assumption) of which .461,000 would be in the adolescent period. If those younger than fifteen are excluded 80% of the increase would be in the age range of 15-34, 29% under 20, 55% under 25. The growth at the older ages would be quite substantial at a rate of 6.5% of the total and four times that in the 35-64 ages. This shifts the locus of demographic problems from the size of the total population to the unbalanced growth of age groups caused by migration. This has serious implications for employment and education and infrastructure usage.

4. Socio-cultural Factors Affecting Fertility

There are several sociological and cultural factors affecting fertility in the Caribbean. Among these are the status of women, low marriage expectations of men, the nature of mating patterns, educational levels, religion, and attitudes and practices of people concerning contraception. These factors are all interrelated and ot times it is difficult to destinguish the differential impact that any one of them exerts on fertility. Furthermore, variation between the islands as regards these factors is inherent as can be ascertained from the above data so discussions here will be admittedly general.

The woman in the Caribbean area is generally considered to be inferior to men. This is reflected in the macho attitudes exihibited by men to women. In some of the countries, there are two activities which guarantee recognition of manhood. The first entails adventurous undertakings with an element of danger. Sumuggling is an example of this sort of escapade and the higher the risk of capture, the more manly the adventure appears in the eyes of his peers. The second means by which manhood is demonstrated is through sexual exploits. The rule of thumb here is the more the better. In part, this has consequences for the marriage aspirations of men. For Jamaican men, the age is 34.1; Barbadians, 31.7; Grenadians, 33.0. On the other hand, West Indian women aspire to marriage but the decision is the man's.

Table 1.3: PROPORTION OF POPULATION UNDER 15 YEARS, 65 YEARS AND ABOVE, AND DEPENDENCY RATIO

Country	Proportion under 15 years		Proportion 65 years and over		Dependency ratio (per 100)	
	1960	1970	1960	1970	1960	1970
Jamaica	41.2	46.1	4.3	5.5	83	107
Trinidad and Tobago	42.4	42.1	4.1	4.4	87	87
Guyana	46.3	47.1	3.4	3.6	98	103
Barbados	38.3	37.1	6.4	8.3	81	84
Windward islands						
St. Lucia	44.3	49.6	4.8	5.3	96	122
Grenada	47.7	47.1	5.2	5.9	112	113
St. Vincent	49.2	51.2	4.2	4.8	115	127
Dominica	44.7	49.1	5.5	5.9	101	122
Leeward islands						
Antigua	42.8	-	4.5	-	90	-
St. Kitts	45.7	-	5.0	-	103	-
Montserrat	42.7	39.8	8.2	9.9	104	99
Belize	44.6	49.3	4.2	4.3	95	116
All countries	44.3	46.4	3.5	4.4	92	103

By reason of this and other barriers they justify extra-marital sex relations. Usually the view prevails that consentual unions are prerequisites to legal marriage and adolescent girls are prone to accept sexual advances as being natural since having a man is necessary to attain respectability. Having a child out of wedlock legitimizes the women among her peers, but that child is not likely to be held as dear as later legitimate children. However, because of the plurality of illegitimate offspring with the community, little stigma is attached.

Many women may enter several conjugal unions in their lifetimes, or they may also get legally married. Illegitimacy is thus, quite widespread, but it assumes more important dimensions when the occurrence is concentrated among nulliparous, teenage girls. Among this population, the incidence of prematurity and low birth rates result in high rates of neonatal, infant and maternal morality.

There are three types of relations in which women may be involved during the span of their child bearing years .

These are married, common law and visiting unions. With each of these, there is a different degree of intensity of exposure to risk of childbearing. Those in married unions tend to have much higher fertility than those in visiting unions where sexual contacts are of an intermittent nature. Furthermore, the

stability and the longevity of a union also have an affect on fertility. Braithewaite et.al. found that in women who spent their entire reproductive life in visiting unions, the average number of children at the end was 2.06, for those in common law, 4.02, and for those in marriage, 3.88. This is a significant difference between the types and has profound implications for family planning as development takes place and aspirations climb.

Education is also correlated with the type of union entered and fertility. Table indicates that women with little of no schooling, 48.7% entered into visiting unions initially where as only 18.2% of women with secondary education did. Another study finds a correlation of .72 at p=.01 between the percentage of women with priamry or no schooling and fertility (average number of children ever born to women 45 to 65 years old).

Religion does seem to play a role in the determination of fertility, but it is difficult to know the extent to which the correlation is independent. In one study in Trinidad, there was a difference of 1.0 average number of births between Catholics on one hand, and Hindus and Moslems at a significance level of .05, indicating that Roman Catholics may practice more birth control than either Moslems or Hindus. Erickson in this study of fertilty in St. Lucia and Grenada, on the other hand, conculded that negative attitudes towards birth control have a tendency to

support childbirth out of wedlock within a Catholic population. Furthermore, in both islands from half to two thirds of the respondents thought it was all right to have sexual experience before marriage. This has potential implications for population growth and family planning.

Table 1.4: URBAN POPULATION AND PROPORTION URBAN BY COUNTRIES, 1960 AND 1970

Country	Total urban population		Urban population as percentage of that population		Number of towns in 1970
	1960	1970	1960	1970	
Jamaica	376,520	690,200	23.4	37.1	14
Trinidad and Tobago	144,766	116,972	17.5	12.4	..
Guyana	87,017	225,482	15.5	29.5	..
Barbados	11,452	8,789	4.9	3.7	1
Windward islands					
St. Lucia					
Grenada	13,098	..	14.8	..	..
St. Vincent	10,937	..	13.7	..	..
Dominica	16,121	..	26.9	..	..
Leeward islands					
Antigua	21,595	..	39.8	..	1
St. Kitts	15,726	..	27.8	..	1
Montserrat					
Belize	48,768		53.9		..
All countries					

Note: .. data not available.

Table 1.5: POPULATION TRENDS, 1911-1970

Country	1911	1921	1946	1960	1970
Jamaica	831,383	858,118	1,237,063 /1	1,627,218	1,881,55.
Trinidad and Tobago	333,552	365,913	557,970	827,959	938,50(
Guyana	296,041	297,691	369,678	560,620	701,71(
Barbados	172,337	156,774	192,800	232,333	236,891
Windward islands					
St. Lucia	48,637	51,505	70,113	86,108	99,806
Grenada	66,750	66,302	72,387	88,677	92,775
St. Vincent	41,877	44,447	61,647	79,948	86,314
Dominica	33,863	37,059	47,624	59,916	69,549
Leeward islands					
Antigua	32,269	29,767	41,757	54,060	65,000
St. Kitts	43,303	38,214	46,243	56,693	46,081
Montserrat	12,196	12,120	14,333	12,167	11,458
Belize	40,458	45,317	59,220	90,505	119,934
All countries	1,952,606	2,003,227	2,770,835	3,776,206	4,349,584

/1 For 1943

/2 Provisional 1970, census estimates

/3 For St. Kitts-Nevis; figures for other years include the population of Anguilla. The estimated population of St. Kitts-Nevis alone for 1960 is 50,000.

Table 1.6: INTERCENSAL POPULATION GROWTH RATE
1911-1921 TO 1960-1970

Country	1911-1921	1921-1946	1946-1960	1960-1970	1911-1970
Jamaica	+ 0.3	+ 1.6/1	+ 1.6/1	+ 1.4	+ 1.4
Trinidad and Tobago	+ 0.9	+ 1.7	+ 2.8	+ 1.3	+ 1.8
Guyana	+ 0.1	+ 0.9	+ 2.9	+ 2.3	+ 1.5
Barbados	- 0.9	+ 0.8	+ 1.3	+ 0.2	+ 0.5
Windward Islands					
St. Lucia	+ 0.6	+ 1.2	+ 1.5	+ 1.5	+ 1.2
Grenada	- 0.1	+ 0.4	+ 1.5	+ 0.4	+ 0.6
St. Vincent	+ 0.6	+ 1.3	+ 1.9	+ 0.8	+ 1.2
Dominica	+ 0.9	+ 1.0	+ 1.7	+ 1.5	+ 1.2
Leeward islands					
Antigua	- 0.8	+ 1.4	+ 1.9	+ 1.9	+ 1.2
St. Kitts 2/	- 1.2	+ 0.8	+ 1.5	- 0.8	-
Montserrat	- 0.1	+ 0.7	- 1.2	- 0.6	- 0.1
Belize	+ 1.1	+ 1.1	+ 3.1	+ 2.8	+ 1.8
All countries	+ 0.2	+ 1.3	+ 2.2	+ 1.4	+ 1.4

/1 For 1921-1943 and 1943-1960

/2 St. Kitts-Nevis-Anguilla up to 1960 and St. Kitts-Nevis for 1960-70.

Table 1.7 : NATURAL INCREASE AND MIGRATION AS PERCENTAGE OF TOTAL GROWTH 1946-1960 and 1960-1970

Country	1946-1960			1960-1970		
	Total growth	Natural increase	Migration	Total growth	Natural increase	Migration
Jamaica	100	+ 146	- 46	100	213	- 113
Trinidad and Tobago	100	+ 97	+ 03	100	218	- 118
Guyana	100	+ 98	+ 2	100	137	- 37
Barbados	100	+ 148	- 48	100	912	- 812
Windward islands	100	+ 174	- 74	100	283	- 183
St. Lucia	100	+ 177	- 77	100	221	- 121
Grenada	100	+ 196	- 96	100	496	- 396
St. Vincent	100	+ 163	- 63	100	387	- 287
Dominica	100	+ 151	- 51	100	200	- 100
Leeward islands	100	+ 187	- 87	100	321	- 221
Antigua	100	+ 127	- 27	100	123	- 23
St. Kitts	100	+ 181	- 81	- 100	272	- 373
Montserrat	- 100	+ 128	- 228	- 100	298	- 398
Belize	100	103	- 3	100	116	- 16
All countries	100	125	- 25	100	202	- 102

Table 1.8: CRUDE BIRTH RATE AND GROSS REPRODUCTIVE RATE 1946, 1960, 1965 and 1970

Country	Birth Rate				GRR	
	1946	1960	1965	1970	1960	1970
Jamaica	30.6	42.1	40.6	34.5	2.77	2.71
Trinidad and Tobago	38.4	39.7	32.8	26.5	2.65	1.81
Guyana	35.0	41.6	39.0	33.9	3.04	2.45
Barbados	31.7	33.8	27.1	20.9	2.29	1.35
Windward islands						
St. Lucia	37.8	49.2	47.1	42.8/2	3.29	3.04
Grenada	32.7	45.3	32.7	29.8/2	3.22	2.40
St. Vincent	38.7	49.9	43.1	36.1/2	3.53	3.03
Dominica	36.2	46.9	43.7	39.3/2	3.31	3.20
Leeward islands						
Antigua	37.0	34.7	29.4	-	-	-
St. Kitts-Nevis	31.8	42.8	32.6	25.1	3.16	1.78
Montserrat	22.0	29.5	32.4	26.4	2.47	2.32
Belize	34.5	45.2	47.0	41.2/1	3.29	3.05
All countries	34.5	41.1	38.2	31.8	2.81	2.39

/1 For 1968

/2 For 1969

Table 1.9 : CRUDE DEATH RATE AND EXPECTATION OF LIFE AT BIRTH, 1960 AND 1970

Country	Crude Death Rate		Life Expectancy			
			Males		Females	
	1960	1970	1960	1970	1960	1970
Jamaica	8.9	7.7	62.6	66.1	66.6	70.0
Trinidad and Tobago	8.0	7.4	62.2	67.2	66.3	70.3
Guyana	9.2	6.8	59.0	63.6	63.0	67.5
Barbados	9.1	8.7	62.7	65.9	67.4	70.9
Windward islands						
St Lucia	14.9	8.5	55.1	58.7	58.5	61.9
Grenada	11.6	8.9	60.1	64.2	65.6	69.6
St. Vincent	15.1	9.7 /1	58.5	62.4	59.7	63.2
Dominica	15.4	9.3	57.0	60.8	59.2	62.6
Leeward islands						
Antitua	10.0	--	60.5	64.5	64.3	68.0
St. Kitts	13.5	7.6	58.0	63.6	61.9	67.5
Montserrat	11.6	10.5	58.8	61.8	62.5	65.5
Belize	7.9	6.3 /1	58.0	63.6	61.9	67.5
All Countries	9.3	7.6	61.3	65.4	65.3	69.1

1/ For 1969

Table 1.10: NET MIGRATION, 1960-1970

Ages	Jamaica			Trinidad and Tobago			Guyana			Barbados		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
0- 4	- 13,822	- 12,720	- 26,543	- 7,841	- 5,939	- 13,780	- 2,380	- 1,686	- 4,066	- 837	- 956	- 1,793
5- 9	- 5,369	- 4,290	- 9,659	- 6,362	- 3,988	- 10,350	+ 3,974	+ 4,749	+ 8,723	- 1,009	- 748	- 1,757
10-14	- 7,216	- 6,975	- 14,191	- 2,405	- 1,564	- 3,969	+ 2,141	+ 2,932	+ 5,073	- 890	- 766	- 1,656
15-19	- 29,034	- 22,900	- 51,934	- 6,653	- 4,726	- 11,379	- 6,307	- 4,647	-10,954	- 2,193	- 2,274	- 4,467
20-24	- 25,179	- 17,700	- 42,879	- 9,933	- 7,958	- 17,891	- 7,239	- 5,624	-12,863	- 2,590	- 3,159	- 5,749
25-29	- 17,222	- 20,747	- 37,969	- 9,779	-10,241	- 20,020	- 5,678	- 5,783	-11,461	- 4,269	- 4,196	- 8,465
30-34	- 16,184	- 23,020	- 39,204	- 7,475	- 6,927	- 14,402	- 3,991	- 3,922	- 7,913	- 2,720	- 2,847	- 5,567
35-39	- 10,155	- 15,697	- 25,851	- 3,930	- 3,922	- 7,852	- 1,279	- 1,928	- 3,207	- 903	- 1,459	- 2,362
40-44	- 3,586	- 8,153	- 11,739	- 3,729	- 3,329	- 7,058	- 1,499	- 1,577	- 3,076	- 647	- 1,004	- 1,651
45-49	- 5,288	- 10,527	- 15,815	- 2,394	- 3,335	- 5,729	- 1,153	- 1,911	- 3,064	- 427	- 1,140	- 1,567
50-54	- 3,888	- 3,665	- 7,553	- 2,534	- 2,424	- 4,958	- 900	- 1,263	- 2,163	- 445	- 802	- 1,247
55-59	- 5,076	- 5,867	- 10,943	- 3,231	- 3,431	- 6,662	- 1,061	- 1,257	- 2,318	- 278	- 564	- 842
60-64	- 2,039	- 2,157	- 4,196	- 2,604	- 2,048	- 4,652	- 1,388	- 1,323	- 2,711	- 390	- 667	- 1,057
65-69	+ 983	+ 150	+ 1,133	- 696	- 948	+ 252	- 477	+ 52	- 425	+ 296	+ 335	+ 631
70-74	+ 76	- 683	- 607	- 735	- 385	- 1,120	- 556	- 612	- 1,168	+ 90	+ 119	+ 209
75+	+ 3,703	+ 6,267	+ 9,970	- 535	- 590	- 1,125	- 201	+ 136	- 65	+ 46	+ 273	+ 319
All Ages	-139,296	-148,683	-287,979	70,840	-59,857	-130,697	-27,994	- 23,664	-51,658	-17,166	19,855	-37,021

Table 1.11 : DISTRIBUTION OF THE POPULATION OF CARIBBEAN COUNTRIES BY AGE AND SEX 1970

Ages	Jamaica	Trinidad	Guyana	Barbados	St. Lucia	Grenada	St. Vincent	Dominica	St. Kitts	Montserrat	Belize
						MALES					
0-14	429,656	196,621	165,735	43,768	24,989	21,934	22,390	17,204	10,863	2,285	29,861
14	21,412	11,630	9,208	2,860	1,186	1,336	1,198	869	639	126	1,502
15-19	80,677	51,195	39,509	12,829	4,634	5,131	4,424	3,235	2,393	541	6,276
20-24	60,194	39,856	27,711	9,875	2,935	3,212	2,727	2,269	1,070	460	4,091
25-34	88,980	51,801	35,599	10,532	3,794	3,482	2,984	2,515	1,089	464	5,878
35-44	76,036	40,228	29,485	8,835	3,259	3,114	2,600	2,271	1,266	343	4,999
45-54	67,023	37,085	22,653	9,086	3,238	2,639	2,256	2,166	2,596	386	3,648
55-64	55,623	24,726	15,903	8,664	2,339	2,287	1,938	1,759	1,644	465	2,887
65+	45,113	18,000	111,167	6,881	1,949	1,893	1,473	1,549	1,124	430	2,451
14+	495,058	274,521	191,325	69,562	23,334	23,094	19,600	16,633	11,945	3,215	31,732
All Ages	903,302	459,512	347,852	110,470	47,137	43,692	40,792	32,968	21,045	5,374	60,091
						FEMALES					
0-14	425,156	195,092	164,011	43,422	24,538	21,787	21,813	16,914	10,991	2,270	29,307
14	21,604	11,785	9,261	2,910	1,215	1,376	1,187	852	670	129	1,491
15-19	85,969	53,350	39,874	12,879	4,960	5,287	4,677	3,563	2,404	535	6,289
20-24	68,262	41,682	28,924	9,567	3,839	3,543	3,239	2,599	1,188	433	4,164
25-34	97,926	55,131	37,627	12,121	4,929	4,277	3,990	3,210	1,492	437	5,865
35-44	85,814	43,337	30,541	12,034	4,487	4,102	3,644	2,881	1,787	444	5,029
45-54	72,642	35,924	21,995	11,626	3,752	3,498	3,046	2,719	1,932	567	3,578
55-64	58,214	23,703	15,087	10,502	2,840	3,049	2,396	2,143	2,003	591	2,920
65+	57,017	23,340	13,937	12,608	3,324	3,540	2,717	2,552	2,043	807	2,691
14+	547,448	288,252	197,246	84,247	29,346	28,672	24,896	20,519	13,519	3,943	32,027
All Ages	951,000	471,559	351,996	124,759	52,669	49,083	45,522	36,581	23,840	6,084	59,843

Table 1.12 : ESTIMATED POPULATION OF CARIBBEAN COUNTRIES BY AGE AND SEX 1980[1]

Ages	Jamaica	Trinidad and Tobago	Guyana	Barbados	St. Lucia	Grenada	St. Vincent	Dominica	St. Kitts	Montserrat[2]	Belize
						MALES					
0-14	475,486	184,874	185,206	36,015	27,546	21,933	23,662	19,938	7,698	2,494	35,382
14	30,974	13,543	11,966	2,845	1,867	1,489	1,585	1,220	743	165	2,218
15-19	147,932	69,936	58,869	14,977	8,705	8,088	8,003	5,850	3,928	813	10,374
20-24	111,138	58,317	48,258	13,730	6,331	7,081	6,470	4,765	3,373	680	8,030
25-34	115,432	78,286	58,872	18,684	5,294	6,356	5,051	4,393	2,471	976	8,993
35-44	73,676	43,601	28,998	8,206	1,994	1,919	1,331	1,649	321	449	4,778
45-54	67,225	34,836	25,216	7,825	2,243	2,249	1,709	1,755	841	322	4,282
55-64	54,763	29,877	19,167	7,635	2,557	2,130	1,763	1,767	1,289	334	3,082
65+	58,309	23,719	15,948	9,160	2,261	2,327	1,904	1,768	1,580	490	2,972
14+	659,449	352,117	267,293	83,063	31,252	31,640	27,816	23,165	14,543	4,229	44,728
All Ages	1,103,961	523,448	440,533	116,233	56,931	52,084	49,893	41,883	21,498	6,558	77,892
						FEMALES					
0-14	468,938	182,563	180,821	35,260	26,869	21,569	22,639	19,457	7,631	2,459	34,273
14	30,916	13,620	11,760	2,781	1,795	1,423	1,556	1,238	707	156	2,177
15-19	148,135	70,080	58,229	14,821	8,371	7,791	7,821	5,763	3,787	775	10,209
20-24	113,903	59,420	48,833	14,005	6,353	7,161	6,196	4,454	3,508	701	8,001
25-34	132,453	83,625	63,094	18,480	6,765	6,686	5,813	5,049	2,507	949	9,518
35-44	77,992	47,235	33,228	9,517	3,385	2,646	2,404	2,371	679	425	5,141
45-54	73,466	37,885	27,601	10,487	3,585	3,221	2,763	2,378	1,337	422	4,541
55-64	61,847	30,224	19,578	9,970	3,152	2,998	2,519	2,321	1,634	511	3,180
65+	70,897	27,971	17,774	13,879	3,292	3,825	2,800	2,572	2,332	734	3,391
14+	709,607	370,059	280,097	93,940	36,696	35,751	31,871	26,148	16,491	4,672	46,157
All Ages	1,147,629	539,002	449,158	126,419	61,770	55,897	52,954	44,367	23,415	6,975	78,253

1/ Assuming a reduction in migration during 1970-1980.
2/ Assuming zero migration.

Table 1.13 : POPULATION GROWTH IN CARIBBEAN COUNTRIES 1960-1970 BY AGE AND SEX

Ages	Jamaica	Trinidad and Tobago	Guyana	Barbados	St. Lucia	Grenada	St. Vincent	Dominica	St. Kitts	Montserrat	Belize
						MALES					
0-14	97,040	20,272	34,822	- 519	-5,722	888	2,442	3,649	780	305	9,610
14											
15-19	12,305	11,765	14,104	2,426	501	-1,393	825	669	1,817	-111	2,475
20-24	3,361	7,736	7,033	2,041	- 102	4,621	24	281	1,291	146	733
25-34	- 3,531	2,109	2,206	- 248	- 423	- 441	- 642	- 328	380	99	276
35-44	- 4,815	- 4,449	3,107	-1,788	- 513	148	- 228	- 136	- 731	- 53	952
45-54	- 4,779	1,967	1,375	-1,669	198	- 268	- 97	- 45	- 549	- 73	165
55-64	13,702	4,908	2,609	1,925	566	484	545	376	539	129	582
65+	16,580	3,624	3,468	2,783	495	366	362	335	220	135	639
14+											
All Ages	129,863	47,932	68,724	4,951	6,444	3,032	3,231	4,801	3,747	- 33	15,432
						FEMALES					
0-14	95,264	20,390	35,696	-1,173	5,696	565	2,456	3,677	550	-338	9,189
14											
15-19	9,533	11,912	13,395	2,078	644	1,231	986	799	1,436	-125	2,321
20-24	225	8,530	7,445	586	249	36	- 90	108	307	19	610
25-34	-14,538	2,822	2,603	-2,836	- 535	-1,090	- 727	- 328	824		- 115
35-44	- 4,963	- 576	4,149	-2,223	- 106	- 63	- 130	- 121	- 61	-109	724
45-54	- 42	3,569	2,484	-1,300	293	- 304	42	51	- 260	-155	- 28
55-64	13,267	4,510	2,196	980	357	232	147	180	486	- 89	594
65+	15,879	4,025	2,826	1,839	656	459	451	466	175	16	702
14+										105	
All Ages	114,625	55,182	70,794	-2,049	7,254	1,066	3,135	4,832	3,457	-676	13,997

Table 1.14 POPULATION GROWTH IN CARIBBEAN COUNTRIES 1970-1980, BY AGE AND SEX[1]

Age	Jamaica	Trinidad and Tobago	Guyana	Barbados	St. Lucia	Grenada	St. Vincent	Dominica	St. Kitts	Montserrat	Belize
						MALES					
0-14	+ 45,830	-11,747	+19,471	- 7,753	+2,557	- 1	+1,272	+2,734	-3,165	+ 209	+ 5,521
14	+ 9,562	+ 2,480	+ 2,758	- 15	+ 681	+ 153	+ 387	+ 351	+ 104	+ 39	+ 716
15-19	+ 67,255	+18,741	+19,360	+ 2,148	+4,070	+2,957	+3,579	+2,615	+1,535	+ 272	+ 4,098
20-24	+ 50,944	+18,461	+20,547	+ 3,855	+3,396	+3,869	+3,743	+2,496	+2,303	+ 220	+ 3,939
25-34	+ 26,452	+26,485	+23,273	+ 8,152	+1,500	+2,874	+2,064	+1,878	+1,382	+ 512	- 3,115
35-44	- 2,360	+ 3,373	- 487	- 629	-1,265	-1,195	-1,269	- 622	- 945	+ 106	- 221
45-54	+ 202	- 2,249	+ 2,563	- 1,261	- 995	- 390	- 547	- 411	- 755	- 64	+ 634
55-64	- 860	+ 5,151	+ 3,174	- 1,029	+ 218	- 157	- 175	+ 8	- 355	- 131	+ 195
65+	+ 13,196	+ 5,719	+ 4,781	+ 2,279	+ 312	+ 434	+ 431	+ 219	+ 456	+ 60	+ 521
14+	+164,391	77,596	+75,968	+13,501	+7,918	+8,546	+8,216	+6,532	+2,598	+1,014	+12,996
All Ages	+200,659	+63,936	+92,681	+ 5,763	+9,794	+8,392	+9,101	+8,915	+ 453	+1,184	+17,801
						FEMALES					
0-14	+ 43,782	-12,529	+16,810	- 8,162	+2,331	- 218	+ 826	+2,543	-3,360	+ 189	+ 4,966
14	+ 9,312	+ 2,195	2,499	- 129	+ 580	+ 47	+ 369	+ 386	+ 37	+ 27	+ 686
15-19	+ 62,166	+16,730	+18,355	+ 1,942	+3,411	+2,504	+3,144	+2,200	+1,383	+ 240	+ 3,920
20-24	+ 45,641	+17,738	+19,909	+ 4,438	+2,514	+3,618	+2,957	+1,855	+2,320	+ 268	+ 3,837
25-34	+ 34,526	+28,494	+25,467	+ 6,359	+1,836	+2,409	+1,823	+1,839	+1,015	+ 518	+ 3,653
35-44	- 7,822	+ 3,898	+ 2,687	- 2,517	-1,102	-1,456	-1,240	- 510	-1,108	- 19	+ 112
45-54	+ 824	+ 1,961	5,606	- 1,139	- 167	- 277	- 283	- 341	- 595	- 145	+ 963
55-64	+ 3,633	+ 6,521	4,491	- 532	+ 312	- 51	+ 123	+ 178	- 369	- 80	+ 260
65+	+ 13,880	+ 4,631	3,837	+ 1,271	- 32	+ 285	+ 83	+ 20	+ 289	- 73	+ 700
14+	+162,159	+81,807	-82,851	+ 9,693	+7,350	+7,079	+6,975	+5,629	+2,972	+ 729	+14,130
All Ages	+196,629	+67,443	+97,162	+ 1,660	+9,101	+6,814	+7,432	+7,786	- 425	+ 891	+18,410

1/ Assuming reduced migration during 1970-1980

Table 1.15 AVERAGE ANNUAL VITAL RATES IN THE CARIFTA STATES: 1946-1970

	Natural Increase Rate (%)		Birth Rate (%)		Death Rate (%)	
	1946-1960	1960-1970	1946-1960	196-1970	1946-1960	1060-1970
1. Jamaica	2.3	3.1	3.4	3.9	1.2	0.8
2. Trinidad & Tobago	2.7	2.7	3.8	3.5	1.1	0.8
3. Guyana	2.9	3.1	4.1	3.8	1.2	0.8
4. Barbados	2.0	1.8	3.3	2.7	1.3	0.9
MDC Mean*	2.4	2.7	3.6	3.5	1.2	0.8
MDC Total	2.4	2.8	-	-	-	-
5. Belize	3.0	3.6	4.0	4.4	1.1	0.7
6. St. Lucia	2.6	3.3	4.1	4.3	1.5	1.0
7. Grenada	2.8	2.6	4.2	3.5	1.3	0.9
8. St. Vincent	3.0	3.3	4.5	4.4	1.5	1.1
9. Dominica	2.4	3.1	4.1	4.1	1.6	1.0
10. Antigua	2.2	2.3	3.5	3.0	1.3	0.8
11. St. Kitts - Nevis	2.6	2.6	3.9	3.8	1.4	1.2
12. Montserrat	1.8	1.8	3.1	2.8	1.4	1.1
LDC Mean*	2.6	2.8	3.9	3.8	1.4	1.0
LDC Total	2.7	2.8	-	-	-	-
CARIFTA Mean*	2.6	2.8	3.8	3.7	1.3	0.9
CARIFTA Total	2.5	2.8	-	-	-	-

Source: Roberts, 1974; Table II

ABBREVIATIONS UTILIZED IN THE PROJECT DESCRIPTIONS

Pan American Health Organization

PAHO/RB .....PAHO Regular Budget

PAHO/CWSF .....PAHO Community Water Supply Fund

PAHO/SFHP.....PAHO Special Fund for Health Promotion

PAHO/PAHEF.....PAHO Pan American Health and Education Fund

PAHO/OF.....PAHO Other Funds

World Health Organization

WHO/RB.....WHO Regular Budget

WHO/UNDP.....United Nations Development Program (funds channeled through WHO)

WHO/UNFPA.....United Nations Fund for Population Activities

WHO/OF.....WHO Other Funds

PROJECT DESCRIPTIONS

BARBADOS-0700 (-2300), Aedes aegypti Eradication

Purpose: Maintenance of a low positivity index and eradication of A. aegypti mosquito.
Probable duration: 1969-1973; 1975-1976.
Assistance provided: Advisory services by the PAHO/WHO Country Representative and AMRO-0710 staff.
Work done: A Letter-Agreement was signed extending the program to 31 December 1976; a meeting was held in June with the National Health Authorities to discuss and assess the program.

BARBADOS-2000 (-2100), Environmental Sanitation

Purpose: Integration of all plans for environmental health with the National Socioeconomic Development Plan.
Probable duration: 1970-
Assistance provided: Advisory services by staff of projects Barbados-2200 and AMRO-2000 and -2010; equipment and supplies.
Work done: A draft letter-agreement to extend the project was prepared and submitted to the Government for consideration. Negotiations were made with the IDB for a loan to construct a sewerage system for Bridgetown.

PAHO/RB

BARBADOS-2001 (-2101), Public Health Engineering

Purpose: Strengthening of the Public Health Engineering Unit of the Ministry of Health.
Probable duration: 1974-1976.
Assistance provided: 1 public health engineer; miscellaneous costs; 1 short-term fellowship.
Work done: An application for a loan from the IDB for construction of the Bridgetown sewerage project was completed. On-the-job training was provided to the existing staff of 5 public health engineering assistants. Interviews of fellowship candidates were held and a selection was made; the fellowship will enable the candidate to specialize in water and sewerage systems.

WHO/UNDP

BARBADOS-2100 (-2201), Waterworks Administration

Purpose: Strengthening of the institutional framework and administrative capabilities of the Waterworks Department.
Probable duration: 1971-1976.

Assistance provided: Advisory services by staff of projects Barbados-2200 and AMRO-2010; 1 short-term fellowship.

Work done: A new agreement for a Caribbean Basin Water Management Program signed by the Canadian International Development Agency and PAHO will expand and render more flexible technical assistance in the field of waterworks administration.

PAHO/RB Government of Barbados

BARBADOS-2200, Solid Waste Management

Purpose: Improvement of the system of collection and disposal of solid waste.

Probable duration: 1975-1978

Assistance provided: 1 sanitary engineer (manager of the project).

Work done: The engineer arrived in August and assumed his duties as manager of the Sanitation Service Authority. Sixteen new refuse collection vehicles arrived and were placed in operation. The existing administrative procedures, job descriptions, technical operations of the Authority were reviewed and evaluated, and some modifications for improvement were introduced.

WHO/UNDP

BARBADOS-3300 (-0702), Animal and Human Health

Purpose: Development of a strategy and infrastructure for the control, prevention, and eventual elimination of zoonotic and other animal diseases of human and animal health significance.

Probable duration: 1974-1978.

Assistance provided: 1 project manager, 1 veterinarian, 1 biologist, and 2 short-term consultants; equipment and supplies and miscellaneous costs; 2 long-term fellowships.

Work done: The following activities were carried out at 100% of target goals: 3,066 animal sera tested for brucellosis; 700 samples of human sera collected and 190 tested for leptospirosis; 145 rodents and 33 other animals cultured for leptospires; 42 human cultures for leptospires initiated; 1,500 homes interviewed regarding rodent knowledge; 637 houses inspected to determine rodent environmental data. Other activities included 543 animal autopsies performed, 251 hematological specimens studies, 611 samples tested for bacteria, and 714 samples tested for parasites. The foregoing represent a 400% increase in laboratory tests.

Two fellowship candidates were posted to Canada and the USA, respectively, for training in veterinary laboratory services, one in zoonoses and the other in public health; and animal health assistants went to the Guyana training program. Two 1-month courses were conducted in veterinary laboratory, microbiology, and parasitology; and a 3-day seminar dealt with leptospirosis, brucellosis, and other zoonoses, food hygiene, and rodent control.

WHO/UNDP

BARBADOS-5000, Health Program Planning and General Activities

Purpose: Planning the general program of PAHO/WHO technical assistance to the country's health sector in keeping with national development policy and strategies. This master program of international collaboration in the health field is the instrument to be used by the PAHO/WHO representatives to coordinate all scheduled activities under the various projects to support the development and extension of health services in the country.

Probable duration: 1975-

Assistance provided: 1 PAHO/WHO Country Representative and 1 secretary; common services.

PAHO/RB, WHO/RB

BARBADOS-5100 (-3100), Development of Health Services

Purpose: Improvement, expansion, and integration of the curative and preventive services; and preparation, implementation, and continuous evaluation of an overall health plan.

Probable duration: 1968-

Assistance provided: Advisory services of project AMRO-5000 staff; supplies (vaccine); and 8 long-term fellowships.

Work done: The Ministry of Health appointed 2 health planning officers. A Health Services Planning and Development Committee (in which PAHO/WHO is represented) was created. A medical officer made responsible for epidemiologic surveillance and full collaboration with the Caribbean Epidemiologic Center (CAREC) was established.

Four candidates received fellowships for studies in public health administration, 1 in rehabilitation, 2 in nursing services, and 1 in public health nursing.

WHO/RB, WHO/UNDP

BARBADOS-5200 (-4801), Hospital Administration

(1965-1975) PAHO/RB, WHO/UNDP

The purpose was to organize and operate the Queen Elizabeth Hospital, both as the principal medical care institution of Barbados and as a teaching hospital for the University of West Indies and to coordinate its activities with those of the psychiatric and district hospitals. The Organization provided 1 expert in medical and hospital administration (1965-1966), 1 expert in hospital administration (1967), advisory services by Headquarters and Zone I Office staff, and the PAHO/WHO Country Representative; 22 short-term consultants; supplies; 37 fellowships.

In 1966 the Government approved the regulations for the Queen Elizabeth Hospital, and in June 1967 the Hospital received the 1st group of medical students from the University of West Indies.

Basic studies were carried out in the Hospital on organizational structure, budgeting and accounting, personnel; dietetics, housekeeping and laundry services; engineering maintenance supply stores; laboratory sample collection systems, requisitioning and examination reporting, and the pharmacy.

A study on radiation control standards, practices, and legislation was completed, and appropriate recommendations were made. All of the country's hospitals, clinics, and dental offices were covered by the study.

The 37 fellowships were awarded for studies in hospital administration, mental health, nursing services, nursing administration and nursing education, pathology, occupational therapy, physiotherapy, medical technology, cytotechnology, tumor registration, auxiliary dental assistance, laboratory technology, serology, medical records and medical records technology, ophthalmic nursing, and nutrition at the postgraduate level.

A preventive maintenance system, based on the equipment inventory of all Barbados hospitals, with the exception of the Queen Elizabeth Hospital, was introduced. Advisory services were provided on the development of the laundry at St. Michael Infirmary to function as a central service for the other 4 district hospitals.

Reviews were made of the structure of 6 district hospitals and the geriatric situation in the district hospital. A number of recommendations made following a rehabilitation review were implemented at the psychiatric and district hospitals.

The following courses were given: 1 intraining course on new procedures of the hospital, a 2-week course on hospital food service (14 staff members), a 2-month course for supervisors of patient activities at the psychiatric hospital; a 3-month course for health statisticians and medical records personnel, and a 4-month course for 7 institutional food supervisors conducted by the Caribbean Food and Nutrition Institute.

A glossary of statistical terms applicable to hospital activities was prepared.

BARBADOS-5500, Management of Health Services

Purpose: Improvement of management techniques in the Ministry of Health.

Probable duration: 1975-

Assistance provided: Advisory services of project AMRO-5510 staff; duty travel and per diem of the 3 participants.

Work done: Three participants attended the continuing education program in the management of health services seminar held in Kingstown, St. Vincent. A control system was designed for evaluation of the project.

PAHO/RB

BELIZE-0200, Malaria Eradication

Purpose: Eradication of malaria.

Probable duration: 1957-1980.

Assistance provided: 1 sanitarian; antimalaria drugs; 1 vehicle; equipment and supplies.

Work done: Antimalaria activities continued to focus on elimination of residual foci of transmission and surveillance operations. First semester DDT spraying

accomplished 91.4% coverage and 2nd semester, 92.8%. The 2 northern districts of Corozal and Orange Walk were not sprayed because of lack of funds.

A total of 19,116 blood smears were examined, and 90 were positive for P. vivax. Epidemiologic investigation revealed that 14 were imported, 3 were cryptics, and 73 autochthonous. Incidence of transmission appeared reduced in all districts except Toledo where it was increasing. Influx and constant movement of population in Toledo was primary cause for increased transmission. The malaria situation in the banana belt area of south Stann Creek, however, was favorable, and it is believed interruption of transmission was attained. Despite the tight financial situation and the importation of malaria cases, through readjustment of program plans and better utilization of funds, the program maintained effective field operations with no major changes from 1974.

PAHO/RB

BELIZE-0700 (-2300), Aedes aegypti Surveillance

Purpose: Maintaining an adequate surveillance system for the vector.
Probable duration: 1972-
Assistance provided: Advisory services by PAHO/WHO Country program Coordinator and Zone III Office staff.
Work done: The country continued to be free of A. aegypti; 10,859 houses were inspected (69% of target) and 94 ships (31.4%) and 426 airplanes (14.8%) were sprayed. Two additional senior personnel were trained in the control of Aedes and other vectors at the November WHO/Danish International Development Agency (DANIDA) course in Jamaica.

BELIZE-1300, Maternal and Child Health

Purpose: Strengthening of the maternal and child health services with the objectives of reducing maternal and child mortality and morbidity and improving coverage and efficiency.
Probable duration: 1975-1978.
Assistance provided: Advisory services by Headquarters and project AMRO-1330; 1 long-term and 2 short-term fellowships.
Work done: A project document was completed and its objectives and activities were identified. The latter included: extension and improvement of MCH services; preparation of technical guidelines for MCH care; training of health personnel; immunization programs against polio, tetanus, diphtheria, smallpox and tuberculosis; and a family life and nutrition education program. Estimates were made of equipment and supplies required for the program.

WHO/RB UNICEF

BELIZE-2000 (-2100), Engineering and Environmental Sanitation

Purpose: Provision of planned environmental health services with emphasis on rural areas.
Probable duration: 1971-1976.
Assistance provided: Part-time services of staff of project AMRO-2030; equipment and supplies.
Work done: The post for 1 sanitary engineer was terminated in 1974, and the activities of this project were transferred to Belize-2101.

BELIZE-2101 (-2201), Water Supply and Sewerage (Belize City)

Purpose: Development of a large-scale environmental health project for Belize City, encompassing water supplies, sewerage, surface drainage, solid-waste management, and fire-fighting.
Probable duration: 1974-1980.
Assistance provided: 1 project manager, 1 sanitary engineer, 1 administrative methods officer, 1 short-term consultant, and advisory services by staff of projects AMRO-2030, -2100, and -2172; equipment and supplies and contractual services.
Work done: The preparatory assistance program to design approaches and strategies for nonconventional sewerage systems was continued, and terms of reference were prepared for the designers of a water and sewerage system for Belize.

WHO/OE, PAHO/PAHEF CIDA

BELIZE-5000, Health Program Planning and General Activities

Purpose: Planning the general program of PAHO/WHO technical assistance to the country's health sector, in keeping with national development policy and strategies. This master program of international cooperation in the health field is the instrument to be used by the PAHO/WHO representatives to coordinate all scheduled activities under the various projects to support the development and extension of health services in the country.

Probable duration: 1975-

Assistance provided: 1 PAHO/WHO Country Representative; equipment and supplies and common services.

PAHO/RB, WHO/RB

BELIZE-5100 (-3100), Development of Health Services

Purpose: Improvement of health care throughout the country, with special reference to increased coverage of the rural areas.

Probable duration: 1962-

Assistance provided: Advisory services by staff of Headquarters, other projects in the country, and AMRO-4130; equipment and supplies; 1 short-term and 4 long-term fellowships.

Work done: Belize was included withing the Caribbean Epidemiology Center (CAREC) community.

A workshop on curriculum development for the Nursing School took place (27-31 October) and 2 teaching nurses attended a 6-week course in El Salvador offered specifically for training nursing personnel. A health inspector attended a meat inspection course in Jamaica.

See also Belize-1300.

WHO/RB

BELIZE-6400, Sanitary Engineering Education

Purpose: Training of engineers, sanitary inspectors, and other auxiliary personnel working in environmental sanitation.

Probable duration: 1966-1976.

Assistance provided: Advisory services by staff of Headquarters and other country projects.

Work done: The Organization helped plan a course in industrial hygiene to be given in 1976.

GRENADA-2100 (-2102), Engineering and Environmental Sciences

(1972-1975) WHO/UNDP

The purpose was to find a solution to problems relating to wastewater disposal and prevention of pollution of beaches. The Organization provided 1 sanitary engineer, equipment and supplies, and 1 short-term fellowship.

Activities were directed toward presenting a practical and economically feasible plan for solving wastewater disposal problems in the Grand'Anse-Morne Rouge area. Training of national counterpart staff also was included. Data on permanent and transitory (tourist) population were collected, assembled, and collated. Existing residential and commercial development, water supplies and wastewater facilities were studied. Demand figures for domestic and commercial water supplies and sewage flows and biologic oxygen demand loadings were projected to 1995.

A topographic study was made which included traversing field investigations and surveys utilized in the preparation of detailed topographic maps.

A preliminary design of the sewerage system was prepared and extensive studies made to avoid deep excavations and excessive pumping. A practical and economically desirable sewer system layout was produced following evaluation and comparison of alternative methods of disposal.

Preliminary engineering drawings were prepared and included line locations, sizes, plans, and profiles and miscellaneous details pertinent to sewers, sewage pumping stations, force-main, and waste stabilization ponds, as well as a cost estimate.

Studies were conducted of organization and management requirements including legislation of a sewer use ordinance.

GRENADA-5100 (-3100), Development of Health Services

Purpose: Improvement of health care delivery to all the population through optimal use of human and financial resources.
Probable duration: 1974-
Assistance provided: Advisory services by staff or project Trinidad and Tobago-5000 and other PAHO/WHO staff in the area; equipment and supplies.
Work done: An inservice nursing education program was planned. A referral system between hospital and health centers was instituted. A medical record filing system for general service clinics was reviewed, and a new system was designed.

PAHO/RB

GRENADA-5201 (-4811), Hospital Administration

Purpose: Improvement of the management of health institutions and the establishment of standards for hospital services.
Probable duration: 1974-1976.
Assistance provided: 1 hospital administrator; 1 long-term fellowship.
Work done: Efforts were concentrated on repairing equipment (surgery air conditioner, sterilizers, laundry boiler, incubators, and food freezers) in order to improve the management and operational capabilities of the General Hospital.

WHO/RB

GUYANA-0200, Malaria Eradication

Purpose: Eradication of malaria.
Probable duration: 1961-
Assistance provided: Advisory services by project AMRO-0210 staff.
Work done: At the beginning of the year, malaria transmission was spreading over the Rupununi Savannah area because of imported sources of infection by the groups of Amerindians returning from Brazil. The resurgence of transmission coincided with the period in which antimalaria activities were limited owing to lack of insecticides and transportation. As a result, transmission continued in many villages and in the Quitaro Forest Balata Bleeding area. With the arrival of DDT in August and new vehicles in October, the malaria teams were able to spray the houses in the foci areas and give radical cure treatment to infected persons. The malaria surveillance system was thus reinstated throughout the savannah area. Malaria cases reached 411 as of 25 October, the highest figure since 1966. Because nearly half of the P. falciparum cases in the Rupununi area were found to be resistant to the standard 3-day treatment with chloroquine, they received a 2-day course of sulfadoxin and pyrimethamine.
A border meeting between Guyana and Surinam was held in Nickerie in January to discuss problems of common interest and future coordination of activities.
A total of 78 collaborators were trained, and malaria personnel prepared in polyvalent health work began to provide multiple services in remote areas.

GUYANA-0700 (-2300), Aedes aegypti Eradication

Purpose: Eradication of A. aegypti, the urban vector of yellow fever, dengue, and dengue hemorrhagic fever, in the entire country.
Probable duration: 1969-1979.
Assistance provided: Advisory services by Headquarters and Zone I staff; equipment and supplies.
Work done: A new Letter-Agreement was signed to extend the program. Attack operations continued in Area I. Five verification and/or treatment cycles were completed (50% of target). Active surveillance was maintained at the international airport and seaport (100%). A. aegypti eggs were collected from several districts and sent to El Salvador for sensitivity testing (100%). Training of newly recruited field assistants was in progress (75%).

PAHO/RB

GUYANA-1400, Nutrition

Purpose: Establishment of a nutrition unit within the Ministry of Health; and development of a nutrition program designed to reduce the incidence of nutrition-related chronic diseases.
Probable duration: 1975-1978.
Assistance provided: Advisory services by staff of Zone I Office and project AMRO-1411.
Work done: The National Food and Nutrition Policy was approved and the development of the organizational framework of the Nutrition Unit was underway. Staff of several hospitals participated in a regional food service supervisors course; a campaign for the promotion of breast-feeding and nutrition monitoring at maternal and child clinics was in progress.

GUYANA-1600 (-4400), Dental Health

Purpose: Improvement and extension of dental health services by promoting dental health education and preventive measures and dental auxiliary training.
Probable duration: 1972-
Assistance provided: Advisory services by Headquarters staff; supplies and educational materials; 1 long-term fellowship.
Work done: An amendment to the Letter-Agreement for a dental health service program was signed. Efforts toward preparation of the building for the Dental Auxiliary Training School, together with procurement of equipment and supplies, continued. Discussions with national health authorities on program implementation also continued.

WHO/RB

GUYANA-2100 (-2201), Water and Sewerage Corporation

Purpose: Establishment of an adequate institutional organization for management of the national water and sewerage program; and undertaking of preinvestment studies as

a basis for long-term planning of community water supplies, waste disposal, and drainage facilities.

Probable duration: 1972-1976.

Assistance provided: 1 project manager, 1 administrative officer, and 3 short-term consultants; miscellaneous costs and contractual services; equipment and supplies; 9 short-term and 1 long-term fellowships.

Work done: The objectives for strengthening the water supply agency through the management assistance program were accomplished (100% of target). Financial and technical feasibility studies for the following were completed: sewerage in Georgetown (100%), Linden (100%), and New Amsterdam (100%); and water supply for Georgetown (100%). The scope of work covering storm drainage was revised. The percentage of the original objectives attained was 50%. To finalize the activity, the Government proposed an additional project.

WHO/UNDP

GUYANA-3100 (-0700), Veterinary Public Health

Purpose: Improvement of the health and nutritional standards of the population by strengthening the recently established Veterinary Public Health Unit; and the development of a veterinary diagnostic laboratory.

Probable duration: 1972-1977.

Assistance provided: Advisory services by staff of Headquarters and project AMRO-3110.

Work done: Draft legislation for the transfer of authority to the Veterinary Public Health Unit in abattoir management and inspection of meat and other foods was prepared (100% of target), The project document for strengthening the veterinary diagnostic laboratory services was prepared and submitted to UNDP (100%). Strict surveillance for foot-and-mouth disease was enforced (100%). Development of the Unit reached 50%.

See also project AMRO-3110.

GUYANA-4100, Nursing Services

Purpose: Quantitative and qualitative improvement of nursing services and education.

Probable duration: 1975-

Assistance provided: 1 nurse and advisory services by project AMRO-4110 staff; 1 long-term fellowship.

Work done: A patient-centered nursing activity study was completed and a report prepared. A 5-day workshop for senior nursing personnel on nursing care standards for the hospitalized patient was held. Standards developed for the Caribbean area were reviewed and modified as necessary, and their implementation was begun. A rotation plan for the basic nursing education program was completed and the curriculum for the first 6 months organized, with the focus on the normal needs of man and the community. A form and guide for evaluating the clinical practice of nursing students was completed. The 2-year basic midwifery program was revised, with the 1st 6 months devoted to basic nursing, 3 months of public health nursing experience, including 1 month of domiciliary midwifery experience. The annual education program for graduate nurses was held (27 December 1974-7 February 1975) and the topic was supervision and management of patient care, with the focus on maternity nursing. Following the program, 3 teaching days were held in each county.

An outline and bibliography were prepared for an inservice program for the organization and management of hospital nursing services. A course in guidance and counselling for nursing tutors was held. Though a plan of action for the MCH program for 1975 was developed implementation was limited. A study was being prepared to evaluate the effectiveness of high-risk antepartum clinics.

PAHO/RB, WHO/UNDP UNICEF

GUYANA-5000, Health Program Planning and General Activities

Purpose: Planning the overall program of PAHO/WHO technical assistance to the country's health sector in keeping with national development policy and strategies. This master program of international assistance in the health field is the instrument to be used by the PAHO/WHO representatives to coordinate all activities scheduled under the various projects to support the development and extension of the country's health services.

Probable duration: 1975-
Assistance provided: 1 PAHO/WHO Country Representative.

PAHO/RB, WHO/RB UNICEF

GUYANA-5100 (-3100), Development of Health Services

Purpose: Improvement and extension of health services to the population of the rural areas.
Probable duration: 1965-
Assistance provided: 2 short-term consultants and advisory services by staff of Headquarters, Zone I Office and projects Guyana-4100 and -5000, and AMRO-4370; equipment and supplies; 3 long-term fellowships.
Work done: A draft agreement was prepared on program planning which will promote close coordination of the work of the Ministry of Health and that of Economic Development.
Under the health education program, the maternal and child health branch promoted a breast-feeding campaign (80% of target) and a national immunization campaign (70%). The malnutrition clinic of the Georgetown Public Hospital and the high-risk clinics in health centers continued to function. Preparatory work was done for establishing local courses for training dental auxiliaries and community nutrition workers (75%). Some progress was made toward the establishment of an epidemiologic surveillance system (50%).
A resource book on health education was prepared for schoolteachers (100%). Health education activities were carried out in the isolated rural community of Aishalton (100%).
Minor improvements were made in the medical records and health statistics services (10%). A first step was taken toward resolving the problem of solid waste disposal (10%).
Plans were begun to establish an improved system of care to rural areas.

PAHO/RB UNICEF

GUYANA-5500 (-3600), Management of Health Services

Purpose: Improvement of the administrative infrastructure at the Ministry of Health.
Probable duration: 1974-1976.
Assistance provided: 1 administrative methods officer; travel and per diem of participants.
Work done: Work targets for the year were selected. Fact-finding studies of the key areas were conducted and improvement recommended (100% of target). The design of portions of a new computerized payroll system was begun (50%). Follow-up work was carried out on an exercise conducted in 1974 to improve certain aspects of the administration of health centers (100%). Three participants attended the 3rd seminar on continuing education programs in the management of health services in Kingstown, St. Vincent (100%).
Work began, according to plan, on establishing a preventive maintenance program for medical and surgical equipment at the Georgetown Public Hospital (50%). Assistance in planning for administrative inputs to the MCH program was provided (75%).

PAHO/RB, WHO/RB

JAMAICA-0700 (-2300), Aedes aegypti Eradication

Purpose: Eradication of the A. aegypti and prevention of reinfestation.
Probable duration: 1975-1980.
Assistance provided: Zone I adviser services and PAHO/WHO local personnel; 3 short-term fellowships.
Work done: The national A. aegypti eradication program entered the attack phase in Regions I and II according to plan. Training activities were accomplished (100% of target): 26 public health inspectors, 2 scientific officers, 110 field assistants and 581 inspectors. The senior medical officer and 2 technical officers visited similar programs in Colombia and Brazil on PAHO/WHO fellowships. At the central level the laboratory for periodical testing of A. aegypti susceptibility to insecticides was established, and preliminary tests showed complete susceptibility. Accounting and budget, logistics, publicity, training and evaluation units, and regional offices were established. In organization and administration, 90% of the activities were accomplished.
The preparatory phase was completed in Region I (Kingston and St. Andrew); Region II (St. Catherine, St. Thomas, and Portland) entered the attack phase according to plan (100%), and Regions III and IV were in the preparatory phase, including geographic reconnaissance and mapping. Inspection for A. aegypti showed 1,050 houses positive, with an index of 9.9%.
The Government assured the necessary funds for fiscal years 1974-1975 and 1975-1976 to cover the national expenditures of the program.
In November, under the auspices of WHO and Danish International Development Agency (DANIDA), a course on biology and control of vectors and rodents in urban areas was held in Kingston with 20 participants from 12 Caribbean and Latin American countries. Particular emphasis was placed on A. aegypti control.

PAHO/RB

JAMAICA-1500 (-4300), Mental Health

Purpose: Decentralization and upgrading of psychiatric care.
Probable duration: 1964-
Assistance provided: 1 psychiatrist and 1 psychiatric nurse.
Work done: A computerized survey of the total population of Bellevue Hospital was completed with WFP funds. A rehabilitation unit was developed and expanded with WFP assistance, including an assessment and retraining workshop which was undergoing completion.

Psychiatric clinics continued to be established by regional psychiatrists and mental officers (nurses) at community hospitals and health centers. The reorganization and restructuring of the mental health services into the nursing section of the Ministry of Health and Environmental Control was implemented.
An assessment of training needs in psychiatric nursing for the Cornwall region was carried out. Involvement in education of professional and lay groups in mental health and community psychiatry was continued.

PAHO/RB, WHO/RB

JAMAICA-2000 (-2100), Water Supplies and Environmental Sanitation

Purpose: Improvement of environmental conditions by developing adequate programming for water supply, sewerage, solid waste disposal, food sanitation, occupational health, and air, water, and soil pollution.
Probable duration: 1968-1977.
Assistance provided: 1 sanitary engineer, 2 short-term consultants, and advisory services by staff of projects AMRO-2101 and -2070; equipment and supplies.
Work done: The Environmental Control Division became a reality within the Ministry of Health. The Division and the Natural Resources Conservation Authority, both recently established, are the 2 main arms of the Government dealing with growing problems of environmental management (100% of target). An organization plan was developed for the Divison's operation (100%), and job descriptions were prepared for various types of personnel (80%). Closer attention was given to waste treatment management in the corporate area, and performance evaluation of treatment plants was carried out (80%). Specific pollution problems were investigated in connection with bauxite-alumina waste and hotels (100%). Terms of reference were prepared in order to commission a study to look at the overall wastewater management and Kingston Harbor pollution (75%). Supervision was provided to the 1st phase of the Institutional Development Program in the National Water Authority (100%), and training courses were implemented in occupational health (100%) and waterworks operations (100%).

PAHO/RB

JAMAICA-2100 (-2204), Water and Sewerage Administration

Purpose: Development of policies, procedures, and manuals that will enable the National Water Authority (NWA) to be effective and efficient in meeting its legal, institutional, financial, engineering, and coverage objectives for providing water and sewerage services.

Probable duration: 1973-1977.

Assistance provided: 1 sanitary engineer (project manager), 3 short-term consultants, and advisory services of staff of project AMRO-2100; equipment and supplies.

Work done: The initial phases of the project were concerned with the preparation of a work execution plan and the organization of the administrative aspects.

Short-term consultants completed their studies in management (100%) and supply and stores procedures (100%). Studies in project management were underway (30%).

The Authority accepted an interim organization plan and its related job descriptions (100%). Progress in implementation was limited to 50% as only the Kingston office was reorganized. The remaining 50% was scheduled for 1976 when 3 regional offices were to be established.

PAHO/CWSF, WHO/RB

CIDA, NWA

JAMAICA-3100 (-0700), Veterinary Public Health

Purpose: Improvement of public health through the study and control of zoonoses; and improvement of the quality of meat hygiene in the country.

Probable duration: 1971-1978.

Assistance provided: Advisory services by projects Jamaica-3300 and -5000 and AMRO-3110.

Work done: A Veterinary Public Health Unit was established (100% of target). Five community (parish) forums were held and on-going committees on zoonoses formed (100%). Eight abattoirs were reviewed and improvements that were feasible recommended (50%). A detailed study was made of current slaughter volume, location of slaughter, and amounts of domestic meat retailed through shops, as input for planning for future abattoir construction and for loan requests (100%). PAHO/WHO staff formed part of an agro-industry committee and furnished technical advice on abattoir development.

See also project AMRO-3110.

JAMAICA-3300 (-0701), Animal Health

Purpose: Improvement of human health through control and/or eradication of animal tuberculosis, brucellosis, leptospirosis, rabies, equine encephalomyelitis, and other zoonoses, and animal diseases that reduce the availability of animal protein for human consumption.

Probable duration: 1973-1976.

Assistance provided: 2 veterinarians and advisory services by staff of projects Jamaica-5000 and AMRO-3130; miscellaneous expenses; equipment and supplies; 6 long-term fellowships.

Work done: Two brucellosis and tuberculosis program evaluation meetings were conducted (100% of target), as a result of which testing activities were concentrated and increased priority given to known infected herds. Area testing was nearly completed in 1 parish and reached 1/2 in another (75%). Quarterly milk-ring testing fell short of of goal because of collection delays (60%).

Four parish meetings were held with medical health officers, public health inspectors, farmers, and butchers on brucellosis and animal tuberculosis as related to surveillance at slaughter (100%). Volume of blood samples collected from slaughtered cattle increased to approximately 20% of potential coverage (25%). Area tuberculosis testing doubled in volume over 1974 with an 0.87 to 0.57% in decline reactor rate (100%).

Six 2-year fellowships were provided for training at the regional education program for animal health and veterinary public health assistants in Guyana (100%); 6 months inservice training was conducted for animal health assistants (100%); and training in postmortem examination was provided in 3 new parishes.

WHO/UNDP

JAMAICA-3600 (-4700), Caribbean Regional Drug Testing Laboratory (Kingston)

Purpose: Establishment of a Regional Drug Testing Laboratory in Jamaica, to perform microbiologic and pharmacologic tests and thus complement the area's national, chemical, and analytical laboratories.

Probable duration: 1974-

Assistance provided: Advisory services by Headquarters staff and the PAHO/WHO Country Representative.

Work done: All participating Governments signed the Agreement covering the Laboratory; a survey was made of the existing laboratory facilities in Jamaica, Barbados, Guyana, and Trinidad and Tobago for testing drugs by chemical, pharmacologic or microbiologic procedures. The Government issued tenders for construction of the laboratory building.

The Caribbean Community Secretariat (CARICOM) requested from CIDA a grant for the purchase of equipment for the Laboratory, and the Organization included in its budget a grant to finance 80% of the cost of 2 scientists. A meeting of the Technical Advisory Committee of the Laboratory was planned for the 2nd half of the year but was postponed until 1976. The 7th Caribbean Health Ministers Conference (Kingston, June) approved Resolution XIX requesting CARICOM to pursue those activities.

JAMAICA-4300, Epidemiologic Surveillance

Purpose: Strengthening epidemiologic surveillance of selected diseases in Jamaica.

Probable duration: 1975-1977.

Assistance provided: 1 short-term consultant and advisory services by PAHO/WHO Country Representative and AMRO-4370 staff.

Work done: The Ministry of Health accepted as national goals the objectives and targets set out at the III Special Meeting of Ministers of Health of the Americas (1972) with respect to control of communicable diseases by immunization. A new Public Health Regulation on immunization was drafted (100% of target). Another concerning notifiable and communicable diseases was passed, which established methods of communication (100%).

Malaria surveillance produced 4 registered cases, which were investigated and classified as imported (100%). Surveillance of gastroenteritis had not reached important levels of operation (10%).

PAHO/RB

JAMAICA-4500 (-5000), Rehabilitation

Purpose: Provision of adequate physical therapy services for the English-speaking Caribbean through the training of therapists in the area.

Probable duration: 1972-1976.

Assistance provided: 1 physiotherapist; equipment and supplies.

Work done: 13 students received diplomas after 3 years of study; 3 failed to sit for supplementary finals (80% of target); 11 were 1st year students (100%); and 13 were last year students (100%).

WHO/RB

JAMAICA-5000, Health Program Planning and General Activities

Purpose: Planning the overall program of PAHO/WHO technical assistance to the country's health sector in keeping with national development policy and strategies. This master program of international assistance in the health field in the instrument to be used by the PAHO/WHO representatives to coordinate all activities scheduled under the various projects to support development and extension of health services in the country.

Probable duration: 1975-

Assistance provided: The PAHO/WHO Country Representative and 1 secretary; common services; equipment and supplies.

PAHO/RB, WHO/RB

JAMAICA-5100 (-3100), Development of Health Services

Purpose: Strengthening of the Ministry of Health to facilitate the establishment of a national health care delivery system, with particular emphasis on the extension of health service coverage to rural areas.

Probable duration: 1965-1980.

Assistance provided: Advisory services by the PAHO/WHO Country Representative and project AMRO-1310 staff; 3 long-term fellowships.

Work done: The Ministry of Health decided to initiate the health planning process with special attention to the extension of coverage through a health center network, located according to demographic requirements and as a part of a national health care delivery system. PAHO/WHO collaborated in the identification of health policies and in designing future steps to be taken (100%).

A project for strengthening primary health care services in the northern region was submitted to the World Bank for financing. It envisions the construction of 60 new health centers, remodelling of 28, training of health personnel, and strengthening of MCH services, nutrition, and family planning. The project is part of the overall national health plan.

Tabulation and analysis of the statistical data improved considerably. The health statistics report for 1974 was completed and published, as was information regarding hospital activities during the 1st semester (100%).

A budget was approved for the Ministry for fiscal year starting 1 July. An Environmental Protection Advisory Committee was established with representatives of all the institutions involved, and presided by the Ministry's Parliamentary Secretary (100%).

PAHO/RB

JAMAICA-5500, (-3600) Management of Health Services

Purpose: Improvement of the management system within the Ministry of Health and Environmental Control.

Probable duration: 1974-

Assistance provided: 1 administrative methods officer and advisory services by project AMRO-5510 staff; travel and per diem; cost of educational activities.

Work done: The program for decentralization of authority to hospital regions in relation to granting of leave progressed with the design of new forms and procedures and implementation in 2 regions (70%). A program for computerizing personnel data on Ministry staff was developed and was being implemented (60%), and several training programs were conducted (65%). Studies were made on personnel and supply management functions at the University Hospital of the West Indies (60%). Three participants attended the continuing education program in the management of health services seminar (Kingstown, St. Vincent). A regional seminar on the management of FP/MCH programs was planned and implemented (100%).

PAHO/RB, WHO/RB

JAMAICA-6400, Sanitary Engineering Education

Purpose: Development of comprehensive and intensive training programs for professional, technical, and auxiliary personnel in sanitary engineering and environmental health

Probable duration: 1971-1978.

Assistance provided: 3 short-term consultants and advisory services by staff of Headquarters, Zone I Office, and project Jamaica-2000; course costs.

Work done: The course on principles of operations and maintenance of water systems was able to provide 28 participants with the necessary technical and practical information to improve their skills in waterworks operation and supervision (100% of target); 24 public health inspectors and nurses were trained in occupational health (100%), and another course was planned for 1976. Plans were made to hold an oil spill control seminar in 1976.

WHO/RB

JAMAICA-6600, Dental Health

Purpose: Improvement of the pattern of dental services currently being provided, with initial emphasis on dental health care for children, and the development of dental auxiliary personnel.

Probable duration: 1975-

Assistance provided: Advisory services by Headquarters and other PAHO/WHO staff assigned to the country.

Work done: 19 dental nurse students completed their 1st year and another 19 graduated. At the Dental Auxiliary School 10 dental assistant students began their training, and curricula and structure were reviewed.

Two proposals were prepared for restructuring the dental service and constructing more clinical facilities. Both awaited Government approval.

A preliminary meeting was held both to discuss the construction of a dental school and to implement a professional training program.

JAMAICA-6700, Biostatistics Education

Purpose: Development and maintenance of an on-going training program in health records and statistics at the College of Arts, Science, and Technology (CAST), Kingston, to meet thenced for trained personnel in the English-speaking Caribbean.

Probable duration: 1974-1978.

Assistance provided: 1 medical records librarian, 1 short-term consultant, and advisory services by projects AMRO-5410 and -6770 staff; reference materials; equipment and supplies.

Work done: 18 students completed the CAST 1-year medical records and health statistics course in August. Of these, 6 were from Antigua, Barbados, Guyana, St. Kits, with 2 from Trinidad and Tobago. Twelve Jamaican students and 1 each from Antigua, Bahamas. Guyana, Montserrat, and Trinidad and Tobago enrolled in the 1975-1976 course.

The national tutor continued her training overseas on a PAHO/WHO fellowship.

PAHO/RB

JAMAICA-7400, Maintenance of Health Care Facilities

Purpose: Improvement of the state and practice of maintenance of health care facilities and equipment; and development of an understanding and appreciation of the value and benefits of planned maintenance.

Probable duration: 1975-1979.

Assistance provided: 1 maintenance engineer and advisory services by project Jamaica 5500 staff; equipment and supplies; 1 long-term fellowship.

Work done: Activities were carried out to transfer maintenance functions in 1976 from the Ministry of Works to the Ministry of Health. At the Cornwall Regional Hospital (Montego Bay), the maintenance force was instructed in this aspect during its steam plant's repair. The new planned preventive maintenance and work order control system was monitored for effective operation. Material stores and storeroom procedures at Cornwall were investigated, and planned rearrangements of both were started. Three workshops for discussion and instruction in management and supervisory techniques were held.

WHO/UNDP

TRINIDAD AND TOBAGO-2000 (-2100), Environmental Sanitation

Purpose: Improvement of environmental conditions affecting the country by organizing, developing, and strengthening environmental health services.

Probable duration: 1969-1976.

Assistance provided: 1 sanitary engineer.

Work done: A national Environmental Sanitation Committee, with representatives from each health-oriented agency engaged in some facet of environmental health, was created, constituting a coordinated governmental approach to an effective program.

An Aedes aegypti Eradication Task Force was established to reduce the hazard of

by the P[illegible] Unit of the Ministry of Health. Food establishments violating [illegible] were close[illegible] until satisfactory compliance was achieved.

PAHO/RB

TRINIDAD AND TOBAGO-2100 (-2201), Training Unit in Water Supplies and Sewerage

Purpose: Development of more effective and efficient personnel in the operational side of the Water and Sewerage Authority (WASA), by strengthening the Training Unit and improving the basic technological and professional standard of the utility in the public interest.

Probable duration: 1974-1978.

Assistance provided: 1 project manager-engineer-educator (9 months) and 1 short-term consultant (1 month); miscellaneous expenses; equipment and supplies; 1 short-term fellowship.

Work done: All goals were essentially achieved. Assessment of WASA training needs indicated 1st priority should be given to developing practical training facilities and programs. Engineering plans were prepared to construct a demonstration and training laboratory at the WASA Training Unit. Equipment was ordered for the laboratory, and delivery of most items was on or ahead of schedule. CIDA agreed to provide additional equipment and supplies for the laboratory as an incentive to WASA to participate further in inter-island training activities, but construction of the laboratory itself, was not started.

The WASA training officer was sent to the U.S.A. and Canada for 2 months for training in instruction techniques. A Training Coordination Committee was established to assist in guiding the project, and an engineer was added to the training unit staff. An investigation of the management-type training needs was carried out and the recommendations, concurred in by WASA, were for the Unit to develop a program for managers as well as for plant supervisors, operators, and maintenance personnel.

WHO/UNDP

TRINIDAD AND TOBAGO-3100 (-0700), Veterinary Public Health

Purpose: Development of effective programs for the prevention, control, and eradication of animal disease; improvement of the standard of meat and food inspection; and establishment of the multidisciplinary approach to public health problems.

Probable duration: 1971-

Assistance provided: 1 veterinarian and advisory services by staff of project Trinidad and Tobago-6500.

Work done: The project manager arrived on 29 October. After that, regular consultations were held with both Ministry of Health Veterinary Public Health Unit and the Ministry of Agriculture Veterinary Division Staff, as well as with various animal and human health care laboratory personnel of the Caribbean Epidemiology Center (CARLC) on matters relating to zoonoses and a surveillance program. Observations of abattoirs were begun as a 1st step in the preparation of recommendations to improve food handling and protection standards, with special emphasis on meat hygiene.

See also project AMRO-3110.

WHO/RB

TRINIDAD AND TOBAGO-4300 (-0100), Epidemiology

Purpose: Development of effective epidemiologic surveillance and control programs for communicable diseases; investigation of chronic diseases; and prevention of reintroduction of diseases by insect vectors.

Probable duration: 1969-1978.

Assistance provided: Advisory services by staff of projects Trinidad and Tobago-5000 and AMRO-0210, -0710, and -4370; 1 short-term fellowship.

Work done: National epidemiologic surveillance was greatly strengthened, with expansion of facilities at the Public Health Laboratory and establishement of both the National Epidemiology Unit and CAREC. Telephone reporting of specific infectious diseases by sentinel physicians to the Unit was instituted as a pilot measure for the Caribbean.

The immunizaton program was further strengthened by adding diphtheria and tetanus to poliomyelitis and smallpox in the Compulsory Immunization Act for school admission.

Surveillance on gastroenteritis was maintained and that on yellow fever was strengthened through monthly meetings of a specific group of experts from the Ministries of Health and Agriculture and CAREC. Active control programs against gastroenteritis, venereal diseases, tuberculosis, and leprosy were maintained.

The Aedes aegypti Eradication Task Force, after thorough investigation, prepared recommendations on the strategy and operational structure for dealing with increased reinfestation. A malaria microscopy course and 2 malaria surveillance courses were carried out for health personnel, and rationalization of malaria surveillance and related future training needs were under study.

Screening for cancer of cervix uteri was continued, and establishment of a cancer registry was arranged. Diabetes, hypertension, and accident prevention were given increasing priority.

WHO/RB

TRINIDAD and TOBAGO-5000, Health Program Planning and General Activities

Purpose: Planning the overall program of PAHO/WHO technical assistance to the country's health sector in keeping with national development policy and strategies. This master program of international assistance in the health field is the instrument to be used by the PAHO/WHO representatives to coordinate all activities scheduled under the various projects to support development and extension of health services in the country.

Probable duration: 1975-

Assistance provided: The PAHO/WHO Country Representative and 1 administrative assistant; common services.

PAHO/RB, WHO/RB

TRINIDAD AND TOBAGO-5100 (-3100), Development of Health Services

Purpose: Development and strengthening of the health service infrastructure to improve efficiency and effectiveness and extend coverage.

Probable duration: 1968-

Assistance provided: Advisory services by staff of Trinidad and Tobago-5000 and of other PAHO/WHO staff in the country; 2 short-term and 1 long-term fellowships.

Work done: The Ministry of Health concentrated its efforts on a nationwide environmental sanitation program and an immunization campaign.

Under an IDB loan, a contract was signed with PAHO/WHO for developing a medical records system and maintaining hospital equipment and nursing practitioner services. Short-term consultants in the hospital and medical records fields became active in the 3rd quarter.

Evaluation of health services, in accordance with the schedule of the Ten-Year Health Plan for the Americas, was completed. Legislation was enacted to facilitate mental health outpatient treatment.

WHO/RB

TRINIDAD AND TOBAGO-5200 (-4800), Hospital Administration and Medical Records

One short-term fellowship was awarded.

WHO/UNDP

TRINIDAD AND TOBAGO-5400 (-3500), Health Statistics

Purpose: Provision of relevant, reliable, and timely information for management, planning, and evaluation of health services.

Probable duration: 1969-

Assistance provided: Advisory services by staff of project West Indies-5400 and AMRO-5410, and by 2 short-term consultants on medical records assigned to Trinidad and Tobago-7400; 1 long-term fellowship.

Work done: Review of the reporting system for vital events was undertaken, and improvements were to be instituted in 1976. The communicable disease reporting system was also reviewed, and a unified approach planned for early 1976. Supportive services were provided by CAREC, which had a beneficial influence on the communicable disease reporting system and the technical capacity of personnel involved.

A 2-month course in medical records and community health statistics was provided, followed by 2 months of supervised practice. The teaching of health statistics was included in the certificate course for public health inspectors and nurses.

Planning and analysis of data was done for the Chief Medical Officer's Annual Report published in 1975 for the 1st time.

WHO/RB

TRINIDAD AND TOBAGO-5500 (-3600), Management of Health Services

Purpose: Improvement of the management of the health services delivery system.
Probable duration: 1974-
Assistance provided: 1 administrative methods officer and advisory services by projects Trinidad and Tobago-5000 and AMRO-5510 staff; travel and per diem of participants in the seminar; 1 long-term fellowship.
Work done: Implementation continued in the model county health service delivery system. The project on improving selected management functions at the Port-of-Spain General Hospital was redesigned and a detailed Plan of Operations completed. Studies were performed and projects designed for reorganizing general medical clinics in a service area and strengthening the administrative structure of the Insect Vector Control Division.
Data were gathered for investigating alternative methods for financing the health services. Six participants attended the continuing education program in the management of health services seminar (Kingstown, St. Vincent).

PAHO/RB, WHO/RB

TRINIDAD AND TOBAGO-6500, Training of Animal Health Assistants

Purpose: Development of a series of inservice training courses in animal health and veterinary public health.
Probable duration: 1974-
Assistance provided: 1 project manager; equipment and supplies.
Work done: A curriculum related to the country's needs was developed, and the 1st 6-month inservice training course was started in March. Training was conducted at the Eastern Caribbean Institute of Agriculture and Forestry. Part-time teaching staff was obtained from the Ministry of Agriculture's Animal Health Division. Requirements for additional buildings were submitted to the Government in April in order to prepare architectural plans.
The 1st group of animal health assistants graduated in September at a ceremony presided by the Minister of Agriculture. A 3-month inservice training course for veterinary public health assistants was given. Most of the equipment required for the project arrived, and 89% of the budget for the year was obligated.
Two part-time instructors attended a 3-day course in Guyana on teaching-learning methods as applied to intermediate-level education. Preserved material and photographic and microscope slides for a visual aid library were being accumulated. A total of 14 animal health assistants and 4 veterinary public health assistants were trained and scheduled for qualification in January 1976. The first 11 months output exceeded projected goals.

WHO/UNDP

TRINIDAD AND TOBAGO-6600, Training School for Dental Nurses

Purpose: Establishment of an effective Government dental service staffed by a well-trained cadre of dental nurses, with particular emphasis on dental care for schoolchildren.
Probable duration: 1975-
Assistance provided: 1 dental officer, 3 short-term consultants, and advisory services by Headquarters and Zone I Office staff; equipment and supplies.
Work done: An overall training program and plan for field utilization were established. The initial premises for the school were obtained and the architect engaged. Equipment for the 1st-year course was selected and ordered. The dental lecturer, the senior dental lecturer, the senior tutor, and the principal were recruited.
The design for an individual course was initiated, and the selection of 10 non-national students was organized with neighboring countries. Admission of 1st-year students was initiated.

WHO/UNDP

TRINIDAD AND TOBAGO-7400, Health and Maintenance Services

Purpose: Organization of a center for the maintenance of health facilities and the equipment and training of personnel; and improvement of hospital and health center medical records systems and the training of personnel for each of the health areas.
Probable duration: 1975-
Assistance provided: 1 short-term consultant in hospital maintenance and 2 short-term consultants in medical records.

Work done: A detailed study of the maintenance procedures and methods in use at the Port-of-Spain General Hospital was made, and the causes of the problems confronted by the Engineering Division in providing maintenance were identified.

Two short-term consultants, on hospital records and on health service records, analyzed current records and statistics systems in hospitals and health centers. Standard definitions, forms and procedures for health units were drafted. An 8-week course, 4 for theory and 4 for practice, was given for 14 statistical clerks from District Health Services.

PAHO/OF

Government of Trinidad and Tobago, 1975

WEST INDIES-0700 (-2300), Aedes aegypti Eradication

Purpose: Eradication of A. aegypti.

Probable duration: 1969-

Assistance provided: 1 sanitary inspector and advisory services by staff of projects AMRO-0700 and -0710; supplies and equipment.

Work done: Montserrat and Antigua: Routine A. aegypti eradication programs were carried satisfactorily. St. Vicent: 4 verification and treatment cycles were completed, and two 6-week training courses were conducted for 6 and 3 inspectors, respectively. Dominica: the program became a control program because of financial constraints. In the British Virgin Islands, only control measures using oil treatment to drums and barrels in the Road Town area were in force. St. Lucia: The program continued operations despite many technical and administrative setbacks. A 1-week inservice training course was held for all field personnel and a 6-week training program was conducted for 8 new inspectors. Anguilla: Operations were suspended because of lack of funds for most of the year. At the end of the last cycle the overall infestation index had risen to over 15%.

See also project AMRO-0701.

WHO/RB

WEST INDIES-1301 (-4901), Family Planning Program (St. Kitts-Nevis)

Purpose: Establishment of family planning services as an integral component of a comprehensive maternal and child health program.

Probable duration: 1971-1976.

Assistance provided: Advisory services by project AMRO 1310 staff; local personnel and miscellaneous costs; equipment and supplies; 2 short-term fellowships (Nevis).

Work done: Six clinics continued to provide specialized family planning services and contraceptive supplies, available in each health center in St. Kitts-Nevis. The number of active acceptors of family planning was around 2,100.

Fellowships were awarded to 2 nurses to study family planning clinic techniques in the U.S.A., and to 3 persons who were engaged (under other projects) in health and welfare services to observe and study the adolescent and youth health services in that country.

WHO/UNFPA and OF

WEST INDIES-1302 (-4902), Family Planning Program (St. Vincent)

Purpose: Strengthening of maternal and child health in St. Vincent by making family planning services available to all individuals on a voluntary basis.

Probable duration: 1974-1979.

Assistance provided: 1 short-term consultant and advisory services by project AMRO-1310 staff; vehicles; local personnel costs; equipment and supplies; 4 short-term fellowships (St. Vincent).

Work done: The project's administrative unit was established (1 medical director, 1 administrator, 1 nurse-coordinator, 1 clerk, and 1 driver-projectionist). Clinic equipment and medical supplies required for the 1st set of clinics were provided, and 2 others were scheduled to open by the end of January 1976. Two nurses, 1 driver-projectionist, 1 administrator, and 1 nurse-coordinator completed overseas training. The curriculum for training family health workers was completed as also was a training course for 12 field workers. A data collection and medical records system was established and was being utilized.

WHO/UNFPA and OF

WEST INDIES-1303 (-4903), Family Planning Program (Dominica)

Purpose: Establishment of family planning services as an integral component of a comprehensive maternal and child health program.

Probable duration: 1972-1976.

Assistance provided: Advisory services by Headquarters and project AMRO-1310 staff; cost of educational activities and local personnel; equipment and supplies; 3 short-term fellowships (Dominica).

Work done: The following was accomplished: the signing of a Tripartite Plan of Operations for 1975-1976 (100% of target); implementation of administrative procedures for inventory of equipment, supplies, and expenditures with quarterly reporting (75%); expansion of Family Planning Clinic services to other health (20%) and supply centers (70%); and continued offering of tubal ligation services in the hospital on request and strengthening of material resources (100%).

Four nurse-midwives were trained in family planning techniques abroad (200%) and 25 were trained locally in a seminar (50%). Local clinical training was continued (60%). Five clinics were equipped, and hospital gynecological service was procured (100%). FP methods continued to be accepted by new clients (60%), and preliminary planning was completed for a dropout study of FP acceptors. A national laboratory technician and male motivator staff were recruited (100%).

WHO/UNFPA and OF

WEST INDIES-1304, Maternal and Child Health (Cayman Islands)

Purpose: Establishment of a maternal and child health and family planning program within the basic health services of the islands.

Probable duration: 1975-1976.

Assistance provided: Advisory services by project AMRO-1310 staff; 1 grant.

Work done: An evaluation was made of existing MCH/FP services and the aspects requiring assistance for planning, execution, and general development of a national MCH/FP program. An overall plan for improving MCH services was prepared and a program of health education and family life program was designed.

PAHO/PAHEF

WEST INDIES-1400 (-4200), Nutrition

Purpose: Improvement of the nutritional status of the population, with emphasis on high-risk groups, through the services of trained personnel and through the integration of nutrition into educational institutions and national health plans.

Probable duration: 1962-

Assistance provided: 1 nutritionist and advisory services by staff of projects AMRO-1310 and 1410; equipment and supplies.

Work done: In St. Vincent, a nutrition education/family planning seminar was held for 25 district and hospital nurses and 30 nursing students (12 hours of training). Other activities included: inservice training and a 12-hour seminar for some 70 food service personnel; increased mass media educational activities by means of 12 articles on breastfeeding in 2 local newspapers and 12 radio talks; teaching in nutrition (4 hours a week), in the School of Nursing for 45 nurses; MCH/FP training of 13 family health workers (18 hours of nutrition education); a nutrition education program for families of malnourished children; a field demonstration in nutrition education for 40 mothers and 7 district nurses in a 2-hour session; and follow-up on: nutrition education and updating of growth charts in child welfare clinics, implementation of the Strategy and Plan of Action for Combating Gastroenteritis and Malnutrition, (for which a committee was designated and a breastfeeding campaign held to assist in attaining the recommended goals), and integration of nutrition into school curricula.

In St. Lucia, highlights included: a review of professional requirements for nutrition field officers; plans for reorganizing the nutrition unit, including the preparation of job descriptions for the posts of dietitian, dietetic technician, and nutrition aides; follow-up activities for integrating nutrition into school curricula. Near completion of a nutrition text for infant schools as a 2nd phase in the integration; inservice training in MCH for district and hospital nurses, and two 3-day seminars for 95 staff members; 12-hour inservice training for some 30 food service workers, including cooks and assistants; approximately 10 community nutrition education programs, including food demonstrations conducted by each field officer each week; revision of the nutrition curricula for the School of Nursing; incorporation of about 70 hours of nutrition studies into the syllabus; development and implementation of a training program for 6 newly assigned nutrition aides; and implementation of a syllabus incorporating 26 hours of nutrition into the curricula of teachers' colleges.

In Dominica, the work included: follow-up on the use of growth charts and other nutrition education activities in child welfare clinics; preparation of plans for

inservice training of food service workers, for which financial assistance was sought; review and follow-up in hospital pediatrics and child welfare clinics including recommendations (by the PAHO/WHO adviser) for feeding regimes (hospital and outpatient), referral system for malnourished children, and use of growth charts; and initiation of nutrition education into school curricula.

WHO/RB

FAO, UNESCO, UNICEF, University of the West Indies

WEST INDIES-1500 (-4300), Mental Health

Two long-term fellowships were awarded (Antigua).

PAHO/RB

WEST INDIES-2100 (-2200), Water Supply and Sewerage

Two short-term (St. Kitts) fellowships were awarded.

WHO/UNDP

WEST INDIES-2101 (-2203), Water Utility Management, Development, and Training

Purpose: Development of effective and viable national agencies that will be able to plan, finance, construct, operate, and maintain water supply and sewerage systems on a long-term basis.

Probable duration: 1974-1977.

Assistance provided: 1 project manager, 2 administrative methods officers, 1 sanitary engineer, 1 short-term consultant, and advisory services by Headquarters staff; miscellaneous expenses; equipment and supplies; 1 short-term and 2 long-term fellowships (Grenada, St. Lucia, and St. Vincent).

Work done: Diagnostic studies to review resources and limitations in the agencies and define full-scale action plans required to upgrade institutional development were conducted in Dominica, Grenada, St. Kitts, St. Lucia, and St. Vincent. These covered engineering, management, administration, finance, and accounting areas. Findings and recommendations were discussed with the Governments in high-level meetings.

In St. Lucia a revised water-rate structure to improve the agency's financial situation was developed, and recommendations on billing were partially implemented. A course on the theory of water treatment was held for 13 plant operators. Inservice training was provided in the use of jar-testing apparatus.

A revised Plan of Operations was prepared following meetings with the Inter-Island Coordinating Committee. The plan rephases project activity, particularly with regard to implementing institutional development and group training activities.

WHO/UNDP

WEST INDIES-2102 (-2204), Water Administration and Plant Operation and Regulation

Two short-term fellowships were awarded (Antigua).

WHO/UNDP

WEST INDIES-2200 (-2103), Solid Waste Disposal Management

One short-term (St. Lucia) fellowship was awarded.

WHO/UNDP

WEST INDIES-4100 (part of -3100), Nursing Services

Purpose: Development of nursing programs in the English-speaking countries and territories of the Eastern Caribbean which contribute to the achievement of national health goals.

Probable duration: 1975-

Assistance provided: 1 nurse and advisory services by AMRO-4110 staff; duty travel.

Work done: In order to implement nursing care standards in Caribbean hospitals, attention was focused on the development of inservice training programs to introduce

ward sisters to concepts of nursing administration and patient care. The programs developed were: in Barbados, 1 at the mental hospital (4 days) for 25 participants and 1 at St. Michael District Hospital (4 days) for 25 participants; Grenada, 1 (5 days) for 16 participants; and in Trinidad and Tobago, 4 (3-5 days each) for 110 participants. Also, a 1-day workshop was held in the British Virgin Islands to introduce nursing care standards to hospital nursing staff and to promote their implementation.
to hospital nursing staff and to promote their implementation.

Plans were made for introducing nursing care plans in selected wards in Antigua. In St. Kitts assistance was given both to developing the theory and objectives of nursing service and preparing policy and procedural manuals.

WHO/RB

WEST INDIES-4201, Health Laboratory Services (Caribbean)

Purpose: Surveillance of health laboratory services in the less developed countries of the Caribbean.

Probable duration: 1975-

Assistance provided: 1 temporary adviser.

Work done: Preliminary discussions were held in Washington, D.C., to finalize the project document and to establish a working program for early 1976.

WHO/UNDP

WEST INDIES-5100 (-3101), Development of Health Services (Leeward Islands)

Purpose: Development and strengthening of the health service infrastructure to improve efficiency and adequate coverage to all areas of the islands.

Probable duration: 1973-

Assistance provided: Advisory services by PAHO/WHO staff assigned to other projects in the area; equipment and supplies; 5 long-term fellowships (Antigua 2, British Virgin Islands, Montserrat, and St. Kitts).

Work done: A multi-agency regional seminar was conducted in Antigua that resulted in the formulation of a strategy and Plan of Action to Combat Gastroenteritis and Malnutrition in Children under 5. A designated epidemiologist and staff from CAREC visited the countries to set up a mechanism for a reliable communicable diseases network in the region. Inservice training and workshops were conducted in the fields of MCH/FP nutrition, and implementation of nursing care standards.

WHO/RB

WEST INDIES-5101, Development of Health Services (Windward Islands)

One short-term and 2 long-term fellowships were awarded (Dominica 2 and St. Vicent).

WHO/RB

WEST INDIES-5200 (-4800), Medical Care and Hospital Administration

Purpose: Improvement of personal health care services and hospital efficiency in the Windward and the Cayman Islands (Montserrat, Cayman, St. Lucia, St. Vincent, St. Kitts).

Probable duration: 1969-

Assistance provided: 2 short-term consultants and advisory services by staff of Zone I Office and of project Jamaica-7400; miscellaneous expense; equipment and supplies; 3 long-term fellowships (Cayman 2 and St. Kitts).

Work done: In Montserrat blueprints for a new hospital were reviewed, and recommendations were incorporated in the final specifications. In Cayman a Public Health Act, a Health Practitioners Act, and a Government Health Services Act were promulgated by the Government. Renovation of inpatient accommodations were completed at the Grand Cayman General Hospital. In St. Kitts-Nevis assistance was provided in institutional preventive maintenance as a follow-up to the 1974 study.

WHO/UNDP

WEST INDIES-5201 (-4812), Hospital Administration (Antigua)

(1972-1975) WHO/UNDP

The purpose was to reorganize the Holberton Hospital and prepare the staff in order to improve the levels of patient care and general administrative efficiency. The Organization provided 1 hospital administrator (1973-1975), 1 short-term consultant, advisory services by staff of Antigua and Barbados offices, and 3 long-term fellowships (Antigua).

In 1972 efforts were centered on reinforcing the staff of the Hopital and improving its administration. A local candidate was selected and began university training in hospital administration; a hospital official attended a management course; a medical records clerk was trained; and the housekeeper received instruction in food service supervision.

In 1973 a hospital administrator was recruited and took up his duties; a seminar on health and hospital statistics was held for medical officers; an activity study on all categories of nursing personnel was carried out and analyzed, and assistance was given for improvement of kitchen services.

In 1974 sanitary conditions at the Hospital were noticeably improved; nonfunctioning equipment was repaired; purchase policies were partially revised, and measures to keep accounts receivable current favorably affected the Hospital's operating revenue.

In 1975 the fellowship candidate for training in hospital administration received the university postgraduate degree in health service administration, and hospital operational policies were prepared.

WEST INDIES-5400 (-3500), Health Statistics

Purpose: Promotion of the development of relevant health records and statistical services in the Governments of the West Indies.

Probable duration: 1969-

Assistance provided: 1 statistician; duty travel.

Work done: Limited progress was made by the Governments in developing their capability to meet their health statistics needs.

The following were accomplished: training in health statistics at the Caribbean family planning middle management seminar; collection, analysis, and presentation of data for an MCH profile for the Commonwealth Caribbean; review of family planning records in Dominica in conjunction with a proposed drop-out study; and assessment of health statistical services in Guyana and Surinam.

PAHO/RB

WEST INDIES-5500 (-3600), Management of Health Services

Purpose: Improvement of the management systems within the infrastructure of the health services of the West Indies.

Probable duration: 1974-

Assistance provided: 1 administrative methods officer; cost of educational activities.

Work done: Baseline data were gathered and compiled (100% of target). Reports on administrative problems of family planning programs were prepared for Barbados, Dominica, and St. Kitts (100%). Leadership modules were produced and distributed (100%). Workshops for many groups were carried out in human relations, leadership, interpersonal communications, change strategies, and other subjects (50%). An assessment was made of current procedures and priorities for future work (100%).

Three administrative officers from Grenada and 3 from St. Kitts attended the continuing education program in the management of health services seminar held in Kingstown, St. Vincent.

PAHO/RB, WHO/RB

WEST INDIES-6300, Development of Nursing Manpower (Antigua)

One long-term fellowship was awarded.

WHO/RB

WEST INDIES-6302 (-6303), Development of Nursing Manpower (Turks and Caicos Islands)

Purpose: Improvement of the quality and quantity of nursing services by training auxiliary nurses and establishing a continuing education program for all categories of staff.

AMRO-0210 (-0201), Malaria Technical Advisory Services (Zone I)

Purpose: Assistance to and coordination of antimalaria activities in the countries of Zone I.

Probable duration: 1969-

Assistance provided: 1 medical officer, 1 secretary, and advisory services by Headquarters staff and the project Surinam-0200 technical officer; equipment and supplies.

Work done: Assistance was provided in the planning programming, and evaluation of on-going programs in French Guiana, Guyana, and Surinam; valid program agreements were maintained. Annual malaria border meetings between Guyana and Surinam and between Surinam and French Guiana were held in January, confirming health authorities' continued high priority in malaria control and deciding on synchronization of antimalaria activities on both sides of the common borders.

A deteriorating malaria situation was arrested in Surinam with revised attack measures and in French Guiana with improved focal operations. However, serious transmission continued in the Rupununi Savannah of Guyana, because of late arrival of DDT and vehicles.

Seven cases of relapsing, criptic, or indigenous P. malariae infection were reported in Trinidad and Tobago, Grenada, and Dominica. The health authorities in the Caribbean were advised to intensify surveillance, and a stock of antimalaria drugs and case detection supplies was built up to meet possible emergencies.

Courses on malaria microscopy and malaria surveillance were held in Surinam and in Trinidad and Tobago.

See also the -0200 projects of French Antilles and Guiana, Guyana, and Surinam.

AMRO-0210 (-0201), Malaria Technical Advisory Service

Purpose: Assistance to and coordination of antimalaria activities in the countries of Zone I.

Probable duration: 1969-

Assistance provided: 1 medical officer, 1 secretary, and advisory services by Headquarters staff and the project Surinam-0200 technical officer; equipment and supplies.

Work done: Assistance was provided in the planning programming, and evaluation of on-going programs in French Guiana, Guyana, and Surinam; valid program agreements were maintained. Annual malaria border meetings between Guyana and Surinam and between Surinam and French Guiana were held in January, confirming health authorities' continued high priority in malaria control and deciding on synchronization of antimalaria activities on both sides of the common borders.

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Seven cases of relapsing, criptic, or indigenous P. malariae infection were reported in Trinidad and Tobago, Grenada, and Dominica. The health authorities in the Caribbean were advised to intensity surveillance, and a stock of antimalaria drugs and case detection supplies was built up to meet possible emergencies.

Courses on malaria microscopy and malaria surveillance were held in Surinam and in Trinidad and Tobago.

See also the -0200 projects of French Antilles and Guiana, Guyana, and Surinam.

PAHO/RB

AMRO-0701 (-2311), Strengthening Dengue Surveillance in the Caribbean

Purpose: Establishing or strengthening the network of laboratories and other centers coordinating dengue surveillance in the Caribbean area.
Probable duration: 1972-1976.
Assistance provided: 3 temporary advisers.
Work done: The status of dengue surveillance in the Dominican Republic, Haiti, and Puerto Rico was evaluated. On the basis of recommendations, planning meetings were held to strengthen surveillance activities for dengue and other febrile illnesses in Hispaniola, utilizing the resources of the CDC, University of Miami, and the PAHO Scientific Advisory Committee. The outbreak of dengue in Puerto Rico with the 1st hemorrhagic fever cases in the Western Hemisphere was documented. Assistance of a WHO temporary adviser to Puerto Rico was provided through the Organization. A Caribbean-wide surveillance program for dengue and dengue hemorrhagic fever was organized through the Caribbean Epidemiology Center (CAREC) and the Washington Office. Contingency plans for emergency application of ULV insecticide were prepared.

A new Scientific Advisory Committee on Dengue, Yellow Fever, and Aedes aegypti was appointed and plans were made for the 1st meeting to be held in Panama in 1976 to review the programs in the Americas. A guide on histopathologic diagnosis of yellow fever was published in Spanish (Scientific Publication 299) and distributed to 200 pathologists in the Region. A limited number of slides were prepared to accompany the guides. Three issues of the Dengue Newsletter for the Americas were published with a Pressrun of 500 copies. A WHO guide on dengue hemorrhagic fever diagnosis and management was also distributed throughout the Caribbean.

PAHO/RB

AMRO-0710 (-2301), Aedes aegypti Eradication (Caribbean Area)

Purpose: Technical advisory services to the countries of the Caribbean area to enable them to eradicate A. aegypti; and coordination and evaluation of the campaigns in progress and those in the preparatory phase.
Probable duration: 1950-
Assistance provided: 1 medical officer.
Work done: Assistance in campaign planning, execution, and evaluation continued to be provided to most of the Caribbean countries. In the majority of the 26 active campaigns, operations in 1975 were carried out on a more regular basis than in 1974 because of the countries' efforts to continue to support these activities. Jamaica and Trinidad and Tobago increased their budgets to expand limited control programs to full-scale eradication campaigns with country-wide coverage. Almost all the active campaigns achieved over 60% of target. Of the 29 countries and territories of Zone I, only 3 had no programmed campaigns underway; of the remaining 26, 8 covered selected areas (30%), and 18 (70%) covered all the infested areas. The most recent addition to the country-wide campaign was Trinidad. Reorganization of the eradication service was scheduled for completion the 1st quarter of 1976.

The French authorities launched an eradication campaign in French St. Martin. Operations were carried on in coordination with the Dutch campaign. Coverage of the whole island with simultaneous attack-phase cycles facilitated achieving the final goal.

Despite the financial, administrative, and operational problems affecting most of the campaigns, the results, as reflected in the very low indices at year's end in nearly 90% of the active campaigns demonstrated the feasibility of A. aegypti eradication. The campaigns, moreover, effectively contributed to protecting the population from the risk of yellow fever and dengue.

See also projects -0700 of Barbados, Guyana, Jamaica, Surinam, and Venezuela.

PAHO/RB

MRO-1300 (-4900), Family Health and Population Dynamics (Interzone)

Purpose: Assistance to Governments in the development of activities in family ealth and population dynamics.

Probable duration: 1968-

Assistance provided: 8 professionals, 11 local staff, 45 short-term consultants nd temporary advisers; cost of educational activities; miscellaneous expenses; grants; quipment and supplies; 16 short-term fellowships (Antigua 4, Barbados 5, Grenada 3, t. Lucia 4).

Work done: A 1975-1976 Work Plan (approved in January) was prepared to provide ooperation and assistance in regional and country programs in family health and popula- ion dynamics and to identify priority areas of action.

With respect to MCH policy and program development, technical assistance was pro- ided to Ecuador, Guatemala, Paraguay, and Uruguay in the preparation of MCH/FP proj- cts for submission to UNFPA for funding, and to Bolivia and St. Vincent in the prepar- tion of extensions of their present UNFPA-funded projects. MCH/FP programs with NFPA/PAHO assistance were implemented in Bolivia, Chile, Colombia, Cuba, Dominica, cuador, Haiti, Mexico, St. Kitts/Nevis, and St. Vincent. Assistance was also given to uyana for an MCH project. Technical assistance in developing an infrastructure for ocial services in health was provided to Colombia, Ecuador, and Guatemala. Diagnosis f the status of the MCH situation and existing programs was made in the Caribbean and nitiated in Central America. In the Caribbean an MCH strategy for future action was ormulated.

Technical assistance in administrative procedures was provided to the MCH/FP rojects in Colombia, Dominica, Haiti, Mexico, St. Kitts/Nevis, and St. Vincent.

The conceptual and mathematical model for analyzing needs in manpower Develop- ent was finalized and applied on an experimental basis in Brazil. Progress was ade in developing new methodologies for teaching MCH and human reproduction in

AMRO-1310 (-4901), Health and Population Dynamics (Zone I)

Purpose: Assistance to the Governments of Zone I in the development of family planning services as an integral part of basic maternal and child health services.

Probable duration: 1968-1976.

Assistance provided: 1 medical officer, 1 health education specialist, and 1 nurse.

Work done: In Cayman a preliminary assessment for developing health education services within the MCH/FP Program was completed. In Jamaica, assistance in preparing the curriculum for a 2-year training program of the midwife continued to be provided. Health education components in MCH of the National Health Plan were developed. The Director of the Bureau of Health Education submitted the document to the Minister of Health and Environmental Control and the Health Planning Committee for review and inclusion in the Plan.

Assistance was provided in the planning of a health education week (scheduled for April 1976), including the development and implementation of an inservice training program for parish level health educators. Continued assistance was provided to the University of the West Indies Epidemiologic/Family Planning Unit in connection with a curriculum and training community health workers for a diploma course in community health; assistance was also given in formulating a course curriculum for the Regional training of coordinators of preschool child development services.

See also projects Surinam-1300 and in West Indies-1301, -1302, and -1303.

WHO/RB, WHO/UNFPA and OF

AMRO-1401 (-4221) and -1480, National Food and Nutrition Policies

Purpose: Assistance to the Governments, in collaboration with other international agencies, in the formulation and implementation of biologically-oriented food and nutrition policies.

Probable duration: 1973-

Assistance provided: 1 nutritionist (from November), 1 short-term consultant, and advisory services by staff of project AMRO-1400; equipment and supplies.

Work done: The Organization devoted considerable attention to the promotion and implementation of food and nutrition policies in the Region. INCAP and CFNI assisted Governments in Central America and the Caribbean. Three countries have formulated their policy for intersectoral implementation: Colombia, Jamaica, and St. Lucia.

The Organization participated in a workshop in Jamaica for the English-speaking Caribbean, and in a seminar in Chile, for the Andean Region, in food and nutrition policies.

PAHO/RB, PAHO/OF

ECLA, FAO, UNESCO, UNICEF

• AMRO-1411 (-4207), Caribbean Food and Nutrition Institute

Purpose: Provision of technical advisory services to Governments of the English-speaking Caribbean to improve the nutrition and health of the people through the formulation, implementation, and evaluation of national food and nutrition policies; conduct of research and training programs in nutrition and food economics at the subregional and national levels; and publication and distribution of information of these subjects.

Probable duration: 1963-

Assistance provided: 1 Director, 10 professionals, 18 local staff, 2 temporary advisers and 1 short-term consultant; common services and cost of a technical group meeting; equipment and supplies; 13 long-term fellowships (Antigua, Barbados, Belize, Dominica, Jamaica 3, Montserrat, St. Vincent, and Trinidad and Tobago 3).

Work done: In the implementation of national food and nutrition policies, assistance was rendered to Jamaica in project planning and food legislation and to St. Lucia on marketing of domestic food crops. As a prerequisite of a future CARICOM food and nutrition policy, a meeting on maximizing food self-sufficiency in the Caribbean was held in Georgetown, Guyana, with over 80 agricultural economists from the area attending.

Progress was made in diagnosing the food and nutrition situation of the countries through consultant missions, data analysis, and reports on food availability, food consumption, and the nutritional status in Belize and Surinam; the collection, checking, and conversion into uniform format and publication of all previously compiled food balance sheets of the area; initiation of quarterly nutrient-cost tables of 60 common foods for 14 countries; and reports on the nutritional status of Antigua and Cayman Islands.

The funds of the UNICEF Maurice Pate Award, given to CFNI, were applied toward the cost of 7 short seminars on MCH and nutrition for the smaller islands; the 1st 2 of the series were held in Antigua and Dominica.

Eleven senior economists and agricultural economists and 1 nutritionist from Barbados, Dominica, Grenada, Jamaica, St. Kitts, St. Lucia, Trinidad and Tobago, and CARICOM Secretariat participated in the 1st half of a 4-week workshop on food economics and food and nutrition planning (Jamaica).

Assistance continued in nutrition teaching in courses at the University of the West Indies. The 4th course for a diploma in community nutrition began in September with 24 students (13 on PAHO/WHO fellowships, 11 funded by their Governments).

A 3-day inservice refresher course was held for 25 professional-level dieticians in Trinidad. Assistance was also given in the training of community health aides. The Institute participated in several intercountry meetings on maternal and child health, which resulted in the formulation and adoption of a strategy and plan of action by the Health Ministers Conference and in the initiation or planning of research, improved records, and materials for the dietary education of patients with diabetes mellitus.

Other CFNI research projects completed included the evaluation of a mass media campaign on breast feeding, the analysis of retail prices of 10 basic foods and food price control, and the effectiveness of supervised supplementary feeding at home in the rehabilitation of young children with severe and moderate protein-calorie malnutrition.

The Institute's Information Services Section became operative. A news service was begun; a prize winning exhibit on infant nutrition was produced and seen by several thousand visitors to Jamaica; 3 technical publications on infant feeding were reprinted; and 2 manuals were published for food service supervisors and on the treatment of protein-calorie malnutrition, respectively. Cajanus continued to be published bimonthly.

PAHO/RB, PAHO/OF, PAHO/PAHEF, WHO/RB

Various Governments and Institutions

• AMRO-1600 (-4400), Dental Health (Interzone)

Purpose: Development of dental health plans and programs within national health plans and strengthening of projects designed to improve the delivery of those services.

Probable duration: 1964-

Assistance provided: 1 dental officer, 5 short-term consultants, and advisory services by Headquarters staff; equipment and supplies.

Work done: Assistance continued in the development of national programs in Ecuador and Venezuela, with particular emphasis on the establishment of structures for extending coverage to rural populations. Advisory assistance for dental programs was also provided to Argentina, Bermuda, Bahamas, Cayman Islands, Colombia, Costa Rica, Cuba, Guatemala, Jamaica, Mexico, Montserrat, Panama, and Venezuela.

Pursuant to a resolution of the VI Caribbean Health Ministers Conference, a proposed plan to develop a dental strategy for the English-speaking Caribbean was approved at the VII Meeting (Kingston, Jamaica). Plans were made to hold initial meetings to develop this service, which would involve a new orientation with respect to initiation of a pilot project.

AMRO-2100 (-2200), Water Supplies and Sewerage

Purpose: Advisory assistance to Governments in establishing priorities and in planning, design, financing; construction, operation, maintenance, and quality control of community water supply systems and of sewage disposal programs.

Probable duration: 1959-

Assistance provided: 2 sanitary engineers, 2 short-term consultants and temporary advisers, 3 secretaries, and advisory services by Zone Offices and AMRO-2070 staff; equipment and supplies.

Work done: Principal activities continued toward assisting the countries in reaching the water supply and sewerage goals of the Ten-Year Health Plan for the Americas. Efforts concentrated on developing means of accelerating the rate at which safe water supplies and adequate sewage-disposal facilities could be provided.

Sector studies identifying resources and constraints--material, financial, and human--and also proposed technical and economic approaches, including the identification of preinvestment projects, were initiated in Argentina and Bermuda.

Substantive technical assistance in UNDP project preparation, implementation, and monitoring was provided. Active UNDP projects were being implemented in Barbados, Grenada, Guyana, Haiti, Trinidad and Tobago, and other Caribbean islands. Initial activity in preinvestment projects was in progress in Chile, Mexico and Surinam. Also, activities for 2 projects were initiated in the Caribbean: for liquid and solid waste management and for water utility management.

Guidance was provided to Government organizations in Guyana and Jamaica in the control of waterborne enteric diseases by improving the bacteriologic quality of drinking water. A subregional conference on the subject was held in São Paulo, Brazil, and planning was underway for the 2nd conference in the Caribbean.

At year's end, the countries reported a cumulative total investment in water supplies and sewerage, since 1961, of approximately US$4.2 billion, 1/3 of which was derived from international loans and bilateral credit agencies and the other 2/3 from internal financing sources. IDB provided the largest share of international funding for these projects.

AMRO-3110 (-0701), Veterinary Public Health (Zone I)

Purpose: Collaboration with the Governments of the Zone in developing veterinary public health services for the control of zoonotic and foodborne diseases, improvement of food hygiene and provision of effective diagnostic services; and promoting veterinary medical education and animal health assistants training.

Probable duration: 1974-

Assistance provided: 1 veterinarian and 1 short-term consultant; financial support for meetings; equipment and supplies.

Work done: The annual and bimonthly meetings of animal and veterinary public health officials of the countries of the Zone were held and animal health and veterinary public health activities were programmed, promoted, and evaluated. The Caribbean Health Ministers Conferences (Kingston, 16-20 June) passed Resolution XVI in support of these programs in the Caribbean.

The UNDP-supported animal health projects of Barbados, Jamaica, and Venezuela made satisfactory progress and an impressive impact.

Assistance was provided to Governments in the preparation of 2 animal health projects for Jamaica and 3 diagnostic laboratory projects for Guyana, Surinam, and associated states, which were submitted to UNDP and CIDA for financial support. The Jamaica and Trinidad projects trained 33 animal health assistants.

The Regional Education Program for animal health and veterinary public health assistants began classes in September in Georgetown, Guyana, with 34 students from 13 Caribbean countries. A feasibility study for the creation of a Caribbean school of veterinary science was completed in October. The II Intra-Caribbean Veterinary Public Health Seminar was held from 3-5 December in Caracas.

• AMRO-4110 (-3201), Nursing (Zone 1)

Purpose: Assistance to the Governments in determining nursing needs and resources; conducting activities to improve the preparation and utilization of nursing personnel; programming nursing and midwifery services within the context of national health plans; and improving nursing care provided to the individual, family, and community.

Probable duration: 1959-

Assistance provided: 1 nurse; equipment and supplies.

Work done: Major activities focused on: implementation of hospital nursing care standards to work toward the goal of providing safe nursing care to the hospitalized patient in Antigua, Bahamas, Barbados, Cayman Islands, Guyana, Jamaica, St. Kitts-Nevis, Trinidad and Tobago, and Venezuela; studies to improve utilization of nursing personnel in Bahamas and Guyana; revision of curricula for programs that prepare nursing personnel at various levels to increase community nursing content and experience in the community setting in Cayman Islands, Guyana, Turks and Caicos; continuing education programs in Barbados, Bahamas, Cayman Islands, Guyana, Jamaica, Surinam, and Venezuela; development of infrastructure in MCH/FP programs and preparation of national MCH manuals in Barbados, Dominica, St. Kitts-Nevis, St. Vincent, and Jamaica; and formulation of community nursing standards in Venezuela.

A community workshop on nursing standards, sponsored by PAHO/WHO and the Venezuelan Government under the Hipólito Unanue Agreement, was held (20-31 October) with Andean Pact country participants.

See also projects -4100 of Bahamas, Guyana, Surinam, Venezuela, and West Indies.

PAHO/RB

• AMRO-4172 (-3216), Standards for Nursing Care

Purpose: Assistance to the countries of the Region in defining basic nursing care standards for both hospitals and community health services and implementing them in order to provide a level of care that will safeguard the life and health of the individual.

Probable duration: 1972-1980.

Assistance provided: Advisory services by Headquarters staff.

Work done: Two working groups were held: in Quito, Ecuador, (21 participants from Bolivia, Colombia, Ecuador, Peru, and Venezuela) to define nursing care standards and the means for applying them in hospital nursing services; and in Caracas, with the collaboration of the Venezuelan Government under the Hipólito Unanue Agreement, for 20 nurses from these countries and Chile to prepare standards for community nursing services. These standards were also defined in Mexico by 70 nurses and in Haiti by 37 nurses for hospital services. Twenty-one countries and the English and Dutch territories of the Caribbean were formulating basic care standards for hospital and community health nursing services.

PAHO/OF, WHO/RB

Government of Venezuela

*AMRO-4370, Caribbean Epidemiology Center (CAREC)

Purpose: Development of a center for epidemiologic surveillance, especially in communicable diseases, in association with the Governments of the Caribbean; provision of selected diagnostic laboratory services required, training in epidemiologic surveillance and laboratory diagnosis; maintenance of facilities for the investigation of selected diseases at international and subregional levels; and conduct of research in the epidemiology of disease problems important to the Caribbean.

Probable duration: 1975-1985.

Assistance provided: 1 Director, 6 professionals, local personnel, and 17 temporary advisers; common and contractual services; cost of educational activities; equipment and supplies.

Work done: The Center initiated its activities on 1 January. In February and March a preliminary assessment of the national surveillance systems and laboratories was carried out in 16 of the participating countries. The baseline information collected was used to develop guidelines for the CAREC program in surveillance, laboratory services, training, and research. The surveillance program is based on close cooperation between CAREC epidemiologists and the designated physician epidemiologists of the area.

Under a special grant from CDC to the Caribbean Commonwealth Secretariat, essential equipment was being provided to the national surveillance laboratory facilities, including filing cabinets, calculators, and laboratory supplies.

A 3-day workshop on Pan-Caribbean Surveillance (Port-of-Spain, 8-10 December) attracted 35 participants from 28 countries in Central America and the Caribbean. Agreement was reached on the information exchange methods and a number of future work areas were identified.

The training department organized 2 laboratory courses for technicians: on enteric bacteriology and parasitology. The former stressed recent advances in the field and the latter emphasized quantitative techniques; 27 representatives from 17 territories attended.

The laboratory was in a transitional stage pending the arrival of a bacteriologist in 1976. All CAREC's bacteriology had been carried out by the Trinidad Public Health Laboratory situated in the same building. The laboratory carried out special surveys on gastroenteritis in the pediatric wards of San Fernando and Port-of-Spain hospitals and also a detailed study with the Public Health Laboratory of a pediatric ward in the mental hospital.

Research projects went forward with the Medical Research Council (U.K.) on rabies in Grenada and leptospirosis in Trinidad. With the Guyana Government, a detailed study was underway on the habits and commercial importance of the blackfly in the Rupununi district.

In association with the Rockefeller University (N.Y.), and funded by the American Heart Association and PAHO/WHO, a study of the immune response in streptococcal disease showed that the lymphocytes in acute rheumatic fever have a highly abnormal cellular in vitro response to locally isolated Group A streptococcal antigens. This response is type-specific and the lymphocytes of the rheumatic individual respond significantly to the rheumatic strain of streptococcus and not to the skin strain associated with nephritis.

A monthly surveillance report (begun in March) was published, and in November it included disease reports from 17 countries. The initial mailing was over 700 copies per month.

PAHO/RB, PAHO/OF, WHO/RB — Various Governments and Institutions

The project to provide dental care to 350,000 rural schoolchildren in Cuba was approved by UNICEF, and equipment purchases were initiated. The new approach applied in a limited number of schools demonstrated the feasibility of the program designed to use a team of professional and auxiliary personnel.

In Mexico, assistance was provided to the health authorities of the State of Mexico to establish dental health programs for children with limited access to dental care. Initial centers demonstrated the possibility of establishing an integrated setting providing education, prevention, and care through a combination of professional and auxiliary personnel.

Montserrat began a preventive program for schoolchildren as part of a project initiated in 1975 for developing systems of delivery of dental services.

In Trinidad and Tobago, the project establishing a dental auxiliary training institution continued to develop with UNDP funding. Advisory assistance was provided in connection with the curriculum, architectural design, and equipment installation. Local professional and auxiliary staff were appointed.

Courses in dental public health were provided in the schools of public health in Argentina, Brazil, Chile, Colombia, and Venezuela.

PAHO/RB

AMRO-1700 (-5100), Chronic Diseases (Interzone)

Purpose: Assistance to Governments in preparing chronic disease control programs based on accurate information on the extent of such diseases, possibilities for primary and secondary prevention, and the availability of the resources needed for conducting effective control programs.

Probable duration: 1967-

Assistance provided: 1 medical officer and 5 short-term consultants; 1 grant.

Work done: Brazil, Chile, Cuba, and Venezuela received technical advisory assistance on cardiovascular diseases; Uruguay on rheumatic diseases, and Cuba on diabetes mellitus.

The Organization collaborated with the English-speaking Caribbean countries in an intercountry project on diabetes mellitus. Working groups including participants from Barbados, Dominica, Jamaica, and Trinidad and Tobago met in Port-of-Spain (22 May and 11-13 November) to design the program and protocol of activities.

Argentina, Bolivia, Brazil, Chile, Guatemala, Peru, and Venezuela, which participated in the intercountry project on prevention of rheumatic fever, sent representatives to a working group meeting held in Porto Alegre, Brazil (15-18 July) to approve the draft protocol and Operations Plan.

The Spanish version of Modern Concepts in Cardiovascular Diseases, a monthly journal of the Inter-American Society of Cardiology, continued to be published and distributed with PAHO/WHO support.

PAHO/RB

AMRO-2010 (-2101, Engineering and Environmental Sciences (Zone I)

Purpose: Technical assistance to Governments and territories of Zone I in the improvement and expansion of environmental health services and structures in the Health Ministries and water and sewerage institutions.

Probable duration: 1960-

Assistance provided: 1 sanitary engineer and 1 secretary; a limited amount of supplies.

Work done: Zone I countries and territories received technical assistance for improving and strengthening the structure of the water and sewerage authorities and public health engineering units in the Ministries of Health. Assistance was provided to Governments in urban and rural water supply, sewerage, solid waste management, environmental pollution (water, soil, air), occupational health, radiation protection, and manpower development.

Progress attained in sanitary engineering and environmental sciences is reflected in projects Bahamas-2000; Barbados-2000, -2001, -2100, and -2200; Belize-2000 and -2101; Grenada-2100; Guyana-2100; Jamaica-2000, -2100, and -6400; Surinam-2000, -2100, and 2101; Trinidad and Tobago-2000 and -2100; Venezuela-2000, -2100, -2300, -2400, -2500, and -6400; West Indies -2100, -2101, -2102, and -2200.

PAHO/RB

AMRO-4410 (-3401), Health Education (Caribbean)

Purpose: Establishment of effective health education programs and services in countries of the area, and training of health and related personnel in this field.

Probable duration: 1965-

Assistance provided: 1 health educator and advisory services by Headquarters and Zone I Office staff; equipment and supplies.

Work done: By 1975 health education services existed in 12 countries and territories. All the countries except Dominica, Montserrat and St. Lucia were being served by health education specialists, who totaled 76, including 31 already trained and 45 who were being trained (with fellowships awarded under other country projects) or were expected to achieve the required level of training by 1977. In 1970 only 6 such specialists were serving in Guyana, Jamaica, and Trinidad and Tobago.

The 1st training course for health educators (18 months) was started in January at the University of the West Indies and was completed by 3 Jamaican students, who received a diploma in community health with emphasis on health education.

In Surinam a specialist trained with a PAHO/WHO fellowship was appointed Director of Health Education. In St. Vincent the health tutor assigned to the Education Ministry resumed his duties after completing specialization studies with another PAHO/WHO fellowship.

Antigua, Barbados, Grenada, St. Kitts and St. Vincent initiated or intensified efforts to develop health curricula at the primary and secondary general education levels, except St. Kitts, which developed them at the Teachers' College level and the 1st 4 of a series of 18 health education units. In Barbados the Teachers' College prepared a health textbook book for teachers. A similar text was prepared in Guyana.

Radio programs supporting Ministry of Health activities were initiated in Antigua and St. Kitts. A study of community attitudes toward rodents was carried out in a parish in Barbados; the findings were useful in planning an educational campaign as part of a rodent control drive.

In Jamaica 44 officials of the National Family Planning Board transferred to the Health Ministry's Bureau of Health Education were given specialized training.

The services of the Barbados film library were expanded and improved to meet the needs of health agencies of the Zone I countries. Assistance was given in connection with the publication of Grassroots, a newsletter on health education in the Caribbean and other parts of the world.

PAHO/RB, WHO/UNDP

AMRO-5010 (-3131), Caribbean Health Ministers' Conference

Purpose: Operation of the Secretariat of the Caribbean Community (CARICOM) Health Ministers' Conference.

Probable duration: 1970-1976.

Assistance provided: 1 medical officer and advisory services by Headquarters and Zone I Office staff; a grant.

Work done: One of the most important activities was the strategy and plan of action for strengthening the maternal and child health services of the Region, prepared by a multidisciplinary group of specialists who met in Antigua from 27-31 January. The plan was then implemented. Progress was reviewed at the CARICOM Health Ministers' Conference (Jamaica, 16-20 June), preceded by the Chief Medical Officers' meeting in St. Lucia from 20-22 April.

The Caribbean Epidemiology Center [illegible] operations on 1 January. Its work program fell under the headings of surveillance, training, and research. Meetings of the Scientific Committee and of the Medical Research Council were held from 17-18 April.

The Secretariat held consultations with Governments, the medical profession, and university and other authorities on reforming medical education and convened a working party on nursing education in Barbados in August. The regional project for training of related health personnel was approved by UNDP, with a grant of US$700,000; 4 other agencies made commitments to the project.

The 2-year health legislation project, which became operative in 1974, completed a study of existing laws and prepared a number of draft enactments intended especially for the less developed countries.

PAHO/RB, WHO/RB

AMRO-5201 (-4813), Hospital Planning and Administration (Interzone)

Purpose: Improved utilization of available medical care resources with a view to extending coverage; suitable planning of new facilities; and improved operation of existing hospitals, particularly at the community level.

Probable duration: 1968-

Assistance provided: Advisory services by Headquarters staff and 1 secretary.

Work done: In Antigua, the administration of St. John's General Hospital was evaluated, as was its relationship with peripheral services and the Mental Hospital.

In Recife, Brazil, a feasibility study was made on a program of technical assistance to the Vitória de Santo Antônio General Hospital, which is the only hospital providing support to peripheral health services in an important, densely populated area of Pernambuco State. In Niterói the Antônio Pedro University Hospital and the Azevedo Lima Sanatorium were studied with a view to possible establishment of a health services microsystem including primary, secondary, and tertiary care.

In Honduras, PAHO/WHO, working with the Permanent Committee and the new Project Chief, reviewed the status of the Tegucigalpa Teaching Hospital project.

AMRO-5310 (-3701), Health Planning and Organization (Zone I)

Purpose: Assistance to the countries of the Caribbean in improving the health delivery system and incorporating the planning process as a means to achieve improvement

Probable duration: 1969-

Assistance provided: 1 health planner; grants.

Work done: Assistance was provided to Governments in the elaboration of PAHO/WHO country programs, and an evaluation was made of the goals of the Ten-Year Health Plan for the Americas. Studies were conducted on national coordination mechanisms for external assistance in the countries.

Assistance was rendered to Jamaica, Grand Cayman, and St. Kitts in their health planning process; Barbados and Guyana, in the creation of health planning units; St. Vincent, in the study of its health system; Venezuela, in the design of its health service coordination system; and St. Maarten, in the elaboration of its health system design.

PAHO/RB, PAHO/OF — Johns Hopkins University

AMRO-5410 (-3501), Health Statistics (Zone I)

Purpose: Development of health records and statistics component of health services information systems capable of meeting their planning, management, and evaluation requirements.

Probable duration: 1964-

Assistance provided: 1 statistician.

Work done: Project activities were carried out primarily in English- and Dutch-speaking Caribbean countries in collaboration with projects Trinidad and Tobago-5400, -1301, and -5401, and West Indies-5400, Jamaica-6700, and Bahamas-5210.

The English-speaking health records and statistics course (in English) at the College of Arts, Science, and Technology in Kingston, Jamaica, continued into its 2nd academic year with 17 students: 12 from Jamaica and 1 each from Antigua, Bahamas, Guyana, Montserrat, and Trinidad and Tobago.

In health statistics, priority was given to developing systems in Bahamas and Trinidad and Tobago. In medical records management, consultant services were provided to Bahamas, Cayman Islands, and Trinidad and Tobago. The WHO study of infant and childhood mortality continued in the latter. Consultant services in demographic statistics were provided for St. Vincent.

See also the -5400 projects of Trinidad and Tobago and the West Indies.

PAHO/RB

• AMRO-5510 (-3601), Administrative Methods and Practices in Public Health (Zone I)

Purpose: Assistance to the Governments in redefining policies for the health sector and in developing the operating capability of the health services in order to contribute to the general improvement of health standards sought by the countries.

Probable duration: 1968-

Assistance provided: 1 administrative methods officer and 1 clerk; seminar costs; equipment and supplies.

Work done: The implementation phase of the continuing education program in the management of health services in the Caribbean continued to be developed. Work was underway in Bahamas, Barbados, Grenada, Guyana, Jamaica, St. Kitts, Surinam, and Trinidad and Tobago. Technical support was provided to management consultants in Barbados, Guyana, Jamaica, and Trinidad and Tobago. A seminar for 10 health administrators was designed and conducted (Kingstown, St. Vincent, 7-12 July), for the purpose of discussing the management of maintenance services for health care facilities, and reviewing the project's progress. A strategy for strengthening maintenance services was defined for each participating country. Attendance from the Caribbean countries was 31.

Assistance was provided to the regional project on management of family planning programs in the Caribbean. A model was designed for developing the operating capacity of Food Hygiene Services and Personnel Administration at the National Institute of Health of Venezuela.

See also the -5500 projects of Bahamas, Barbados, Guyana, Jamaica, Surinam, Trinidad and Tobago, Venezuela and West Indies.

PAHO/RB

• AMRO-6310 (-6301), Nursing Education (Zone I)

Purpose: Improvement in the quality of nursing education programs in the English-speaking Caribbean to prepare nursing personnel to carry out their roles effectively and to respond to community needs.

Probable duration: 1963-

Assistance provided: 1 nurse educator, 1 short-term consultant, and advisory services by project AMRO-4110 staff.

Work done: The Nursing School faculty of the University Hospital of the West Indies in Jamaica made concrete plans for changing the focus of the 3-year program, viz., from being completely hospital-oriented to one which will have a balanced community- and hospital- orientation. The new curriculum was to go into effect in 1976.

PAHO/RB

• AMRO-6500, Veterinary Medical Education

Purpose: Improvement of veterinary medical education in accordance with the needs of the countries through the training of professors and administrators of the schools in methods of curriculum revision, improvement of teaching-learning methods, and the organization of postgraduate and continuing education, thereby permitting veterinarians to update their knowledge and improve their capacity.

Probable duration: 1966-

Assistance provided: 1 veterinarian, 1 short-term consultant, and 1 secretary; equipment and supplies.

Work done: A meeting on the promotion, design, preparation, and conduct of the Advisory Study Group on the Teaching of Physiology in Veterinary Medical Education in Latin America was held (Mexico City, May). Assistance was furnished the Government of Mexico in the organization and conduct of the National Seminar on the Teaching of Veterinary Physiology in the Schools of Veterinary Medicine.

The Organization participated in the XX World Veterinary Congress (Thessalonike, Greece, July) and presented 2 working papers on veterinary medical education.

Pursuant to Resolution X of the VIII Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control (April) a mission of 2 consultants conducted a preliminary study in the English-speaking Caribbean area to determine the attitude and intent of 4 Governments toward establishing a veterinary medical education program for that area. Included in the mission's recommendations was a complete feasibility study to determine if that program should be established in the Caribbean area or whether a working arrangement should be made between the Governments and schools of veterinary medicine in the U.S.A. and Canada.

Assistance was provided to the Government of Guyana in the implementation and conduct of the regional educational program for animal health assistants for the Caribbean area in Georgetown.

A member of the Association of Teachers of Veterinary Public Health and Preventive Medicine of the U.S.A. and Canada represented PAHO as a temporary adviser at the

• AMRO-6910 (-6113), Education and Training of Paramedical Personnel (Caribbean Area)

Purpose: Formation of paramedical personnel adequate in number and quality to meet the needs of the health services of the Commonwealth Caribbean countries.

Probable duration: 1972-

Assistance provided: 1 project manager, 1 administrative assistant, 1 secretary, and 3 temporary advisers; miscellaneous and local costs; financial assistance for educational activities; 11 short-term and 7 long-term fellowships (Antigua, Barbados 6, Belize 2, Guyana 4, St. Kitts 2, St. Lucia 2, and St. Vincent).

Work done: Continuous advisory services were given to all the Caribbean area countries, where the institutionalized, multidisciplinary, and regional approach was consistently promoted.

The 1st advisory committee meeting was held in Barbados (24-26 November) (100% of target). Administrative arrangements for certification-validation by the University of the West Indies were not complete, but medical faculty board approval was obtained. With regard to national coordinating mechanisms, heads of departments-divisions of the health sciences were appointed in Barbados and Guyana, and tutorial service committees were set up and were working for all disciplines at the Barbados Community College and at the University of Guyana (75%). Recruitment of tutorial staff was rather slower for the College's Division of Health Sciences than had been anticipated, and the Project Hope tutorial staff made an important contribution. In Guyana, there was continued reliance on part-time staff, but 2 advertisements for full-time tutors resulted in some reason for optimism at the end of the year (25%).

A review was made of nursing education programs as the core of what will develop into local divisions of health sciences. A background paper was prepared on the relevance of the project to nursing education, and PAHO/WHO participated in a working party on nursing education convened by CARICOM Secretary General (Barbados, August). A proposal was prepared and presented in November to the Ministries of Health, suggesting that a special committee be set up in each country to review nursing education and, in particular, its integration with the education and training of other types of health personnel. Accomplishments in nursing were estimated at 80% of the target.

The fellowships awarded were for studies in epidemiology, nursing services and teaching, nutrition, medical records, and laboratory and pharmacy services at educational institutions in Barbados, Guyana, Jamaica, and Trinidad and Tobago (100%).

Teaching materials were ordered for health sciences education at the regional centers in Barbados and Guyana and for local training of nurses and other health personnel in Antigua and St. Vincent (100%).

Assistance was also provided in the preparation of a summary of the project, presented at a meeting sponsored by Howard University and held at PAHO Headquarters, Washington, D.C., in February, and progress reports which were presented at a meeting of the chief medical officers in St. Lucia (May) and of Ministers of Health in Jamaica (June).

PAHO/WHO was represented at a meeting sponsored by the Community Health Association of Antigua and the University of the West Indies on the subject of community health aides (Antigua, 18-19 April) and at a meeting of the Commonwealth Caribbean Medical Council's Commission on Medical Education (Jamaica, 7-8 November).

Talks were held with the senior staff of the McMaster University School of Health Sciences and the School of Health and Social Services of Florida International University on the project's activities, and with a MEDEX officer of Hawaii University on regional implications and fundings of a proposed medical assistant training program in Guyana and Barbados.

PAHO/OF, WHO/UNDP

UNICEF

AMRO-7400 (part of -4813), Hospital Maintenance and Engineering

Purpose: Development of engineering and maintenance systems for health facilities and training of technicians in this field.

Probable duration: 1975-

Assistance provided; 1 maintenance engineer and 1 secretary; equipment and supplies.

Work done: PAHO/WHO, in collaboration with the Andean Group and special inputs of the Venezuelan Health Ministry, developed a working document which, after review, will be submitted officially to the 1976 meeting of Ministers of Health of that region. The document called for the integration of engineering technology, education and training, and organizational development of a biomedical engineering program to support the health care delivery system.

The drafting of a UNDP/PAHO assistance project for Argentina was completed, which will include a training program for personnel in operational maintenance and engineering.

In collaboration with the CARICOM Secretariat, a document was drafted for developing training programs in the engineering and maintenance of health facilities.

Assistance was given to the Governments of Bahamas, El Salvador, Jamaica, Peru, Trinidad and Tobago, and Uruguay in the establishment of national maintenance systems and training programs for technicians in operational maintenance. Visits were made to Central America and Panama to evaluate the 1974 program and study the possibility of establishing national maintenance and engineering systems for health care facilities. A great interest was shown and all countries were aware that national efforts would be required to curtail the equipment loss now prevalent.

In Colombia the construction and equipment of a training facility for repairing medical equipment was completed and inaugurated by the Government in August.

In Mexico assistance was given to the First International Symposium on Hospital Engineering and Maintenance sponsored by the Government and the Mexican Social Security Institute. Several technical papers were presented and discussed.

Nicaragua received assistance in the opening of 2 new hospitals and in the establishment of an operational maintenance unit.

PAHO/RB

Multilateral Assistance in the Health Sector - PAHO/WHO/UNDP/IPPF

The following programs sponsored by multilateral agencies have been identified and summarized in the Project Activities Document of PAHO an an annex to the Annual Report of the Director (no. 143-4) (1975) and their Proposed Program and Budget Estimates (1977-78.) They include the health activities of the United Nations group; including the PAHO Regular Budget (PAHO/RB), the PAHO Community Water Supply Fund (PAHO/CWSF), the PAHO Health and Education Foundation (PAHO/PAHEF), the PAHO Special Fund for Health Promotion (PAHO/SFHP), and PAHO other Funds (PAHO/OF). In addition through WHO programs from the Regular Budget (WHO/RB), the United Nations Development Program (WHO/UNDP) and the United Nations Fund for Population Activities and other funds (WHO/UNFPA/OF) programs are funded in the Commonwealth Caribbean and are identified in the summary project descriptions that follow. Detailed descriptions of the activities involved in these projects are attached as Appendix III. The funds allocated to each project are listed in the Proposed Program and Budget Estimates for 1977-78. These estimates include the funding breakdowns for

personnel, supplies and equipment, training costs, adn fellowships. In addition the numbers and levels of personnel utilized are included.

PROJECT SUMMARIES

BARBADOS

BARBADOS-0700, AEDES AEGYPTI ERADICATION

The Aedes aegypti index in Barbados has been maintained at 0.1 in spite of a number of adverse factors affecting the program. The purpose of this project is to completely eradicate the Aedes aegypti mosquito from the country.

Specific objectives are to mount final intensive measures to eradicate the mosquito and to maximize all efforts towards improvement of the environment so as to support the measures which are more specific to Aedes aegypti eradication.

BARBADOS-2000, ENVIRONMENTAL SANITATION

The Government of Barbados has shown its concern for the improvement of environmental health by setting up the Public Health Engineering Unit; by collaborating with PAHO/WHO in a project for waterworks administration development and training; by initiating a project with UNDP and PAHO/WHO for solid waste disposal in which it has made considerable initial investment in heavy equipment and machinery; and, finally, by entering into negotiation with

the IDB for the construction and mangement of a sewerage system for the city of Bridgetown.

The purpose of this project is to integrate all plans for environmental health with the national Socio-Economic Development Plan. The objectives are the formulation and revision of plans and programs for water supply and liquio and solid waste disposal; prevention of air, water and soil pollution; occupational health; food control; housing and other environmental health activities; and the execution and evaluation of environmental health programs as they are formulated and approved by the Water Works Department, the Public Health Engineering Unit and other related agencies.

BARBADOS-2001, PUBLIC HEALTH ENGINEERING

The purpose of this project is to provide assistance to the Public Health Engineering Unit of the Ministry f Health, which consists of a senior public health engineer, a public health engineer, and five public health engineering assistants.

The project includes assistance in the day-to-day functions of the Unit, training existing personnel, and locating and preparing new personnel.

BARBADOS-2100, WATER ADMINISTRATION

Barbados has a satisfactory water supply system, but

the Water Works Department needs improvement and stregthening of its administrative structure. The purpose of this project is to strengthen the institutional framework and administrative capabilities of the Department.

One of the major objectives is to prepare the way for the incorporation of the Water Works Department and the proposed Bridgetown sewerage system into a single agency, to ensure development of water resources necessary for the development of the country and efficient operation of the sewage disposal system.

BARBADOS-2200, SOLID WASTE MANAGEMENT

The purpose of this project is to assist the new Sanitation Service Authority in performing its main function of providing proper collection and disposal of all solid waste material generated in Barbados. Both administrative and technical assistance are to be provided to the Authority for a period of two years. The project provides on-the-job training and fellowships for the manager and deputy manager trainees.

BARBADOS-3300, ANIMAL AND HUMAN HEALTH

Importation of goods into Barbados, particularly foodstuffs, has produced a tremendous outflow of capital. In order to eliminate this capital loss the Government is

making every effort to improve agriculture, especially the production of livestock. Brucellosis, leptospirosis and many other animal diseases present in Barbados have been shown to have serious deleterious effects on a viable livestock industry. Some of these diseases have human health significance, particularly leptospirosis.

In order to assist the Government in studying these problems, with a view to providing economical and feasible solutions, the goals for this project are (1) to develop a national animal health and veterinary public health program; (2) to determine prevalence and reduce occurrence of zoonotic diseases, especially leptospirosis and brucellosis; (3) to assist in the development of a viable livestock industry through improved diagnostic services at the Veterinary Diagnostic Laboaratory; (4) to assist in the development of a more efficient and internationally accepted processing and inspection program; and (5) to train veterinary and rodent control personnel.

BARBADOS-5500, PROGRAM PLANNING AND GENERAL ACTIVITIES

The purpose of this project is to improve the quality of health services and to extend coverage to the entire population. The objectives are to set up a full-time health planning unit, for which two posts are already provided in

the national health budget; to develop a comprehensive health care delivery system; and to improve the quality of environmental health, including occupational health. Efforts will be made to achieve the Government's adjusted goals of the Ten-Year Health Plan for the Americas.

BARBADOS-5100, DEVELOPMENT OF HEALTH SERVICES

Objectives of this comprehensive health services project include preparation of a national heath plan aimed at achieving the Government's adjusted goals of the Ten-Year Health Plan for the Americas, with special attention to the improvement of the quality and the extension of health care coverage; preparation for the introduction of a national health service; integration of all health care activities; strengthening of epidemiological surveillance; and introduction of technical and administrative reform to increase the coordination between elements within the Ministry of Health and its field institutions, as well as between these and other sectors whose functions have a bearing on the nation's health.

BARBADOS-5200, HOSPITAL ADMINISTRATION

The Barbados Development Plan has the following three principal objectives in the institutional area for health: to develop rehabilitation and geriatric services; to improve

inpatient and outpatient care; and to improve the care of the mentally ill and reduce the incidence of mental disorders. The purpose of this project is to cooperate in these activities.

BELIZE

BELIZE-0200, MALARIA AND AEGYPTI ERADICATION

The malaria program continues with effective surveillance activities and is maintaining malaria incidence at a low level. However, agriculture development, particularly in the south, has attracted immigrants and laborers from the neighboring countries where malaria transmission still exists. The high vulnerability and receptivity require application of anti-malaria measures to eliminate foci of transmission originating from imported cases and to prevent deterioration in the epidemiological situation.

The country has been free of the Aedes aegypti mosquito since 1956. It is, however, in a vulnerable situation because of its close air and sea links with the other Central American countries, all of which are infested. The purpose of the project is to maintain the country free from

the mosquito. This entails a high level of vigilance and maintenance of the country in a state of readiness to eradicate the mosquito should reinfestation occur. There have been some problems in the program, notably transport and supervision, but changes have been made which should result in a demonstrable improvement. It is important that the supervisors receive relevant training, and provision is made for this.

BELIZE-1300, MATERNAL AND CHILD HEALTH

This project serves the health interests of women of childbearing age and children under five years of age, who together comprise more than one-third of the population. Mortality and morbidity data reveal that there is room for improvement in the health situation of these two groups. The Government is aware of this, and has made maternal and child health one of its priorities, establishing this project with the joint assistance of PAHO/WHO and UNICEF.

The purpose of the project is to extend the coverage and improve the quality of care for mothers and children.

BELIZE-2101, WATER SUPPLY AND SEWERAGE (BELIZE CITY)

The purpose of this project is to cooperate in the preparatory stages of augmentation of the existing water supply system and the sewerage and solid waste disposal

services in Belize City.

BELIZE-5000, PROGRAM PLANNING AND GENERAL ACTIVITIES

The purpose of this project is to cooperate with the Government in improving the efficiency of the administrative system and to promote organized health planning. One of the Government's priorities is maternal and child health, and a major activity of the budget period will be the systematic programming of this service, as a preliminary to overall health planning.

BELIZE-5100, DEVELOPMENT OF HEALTH SERVICES

The purpose of this project is to improve and develop health services so that the entire population will be provided with efficient and timely health care. Emphasis will be placed on the optimal use of scarce human and financial resources and the development of the full potential of all health personnel.

BELIZE-6400, SANITARY ENGINEERING EDUCATION

The purpose of this project is to collaborate with the local institutions by providing training and technical information in selected fields of environmental health.

GRENADA

GRENADA-2100, SANITARY DISPOSAL ADVISER, SEWERAGE

Advisory services have been provided in the design of a sewerage system for the hotels and residential districts in certain areas and in the extension of the system to other areas of St. George's.

GRENADA-5100 DEVELOPMENT OF HEALTH SERVICES

Health service delivery in Grenada is presently dependent on an insufficient number of nursing staff, health inspectors and auxiliary health staff.

The purpose of this project is to advise the Government in improving the standard of health care delivery to all the population, consistent with present political, financial and development plans.

GRENADA-5201, HOSPITAL ADMINISTRATION

The purpose of this project is to give assistance in the improvement of the management of health institutions in Grenada, and in the establishment of standards for hospital services.

GUYANA

GUYANA-0200, MALARIA ERADICATION

The soaring prices of insecticides, spraying equipment,

and transport, followed by a shortage of insecticides has, since 1973, adversely affected the progress of antimalaria operations and consequently the epidemiological situation of malaria in the continental countries of Area I. Transmission has continued at a high level or even increased in Venezuela, Surinam, and French Guiana, and in the southwestern frontier of Guyana. While coordination of antimalaria work on common borders has improved considerably, shortages of trained staff and problems in administrative management have remained among the impeding factors, especially in Surinam and Guyana. Chloroquine-resistant strains of Plasmodium falciparum, discovered in Guyana in 1962, were recently found in Surinam, French Guiana and Guyana. Malaria surveillance in consolidation areas and vigilance in maintenance areas need strengthening.

The purposes of this project for Guyana and neighboring countries are (1) to facilitate the eradication program in the countries which still have areas in attack and/or consolidation phases; (2) to coordinate intercountry activities, especially in the border areas; (3) to advise on the maintenance of an effective malaria vigilance system in the areas where eradication has been accomplished; and (4) to provide assistance for research activities on the

epidemiology of malaria.

GUYANA-0700, AEDES AEGYPTI ERADICATION

Progress in this program has been slow, constraints being shortage of insecticides, transport difficulties and poor managerial performance. In the revised plan of operations, eradication is now anticipated for 1979.

The purpose of the project is to eradicate Aedes aegypti from Guyana, and assistance is required to achieve the present goals of improved managerial performance, upgrading of the skills of workers, and allocation of adequate resources to the program. A twice-yearly program review with the Government is scheduled.

GUYANA-1400, NUTRITION

The purpose of the project is to reduce malnutrition and to promote cooperative efforts toward the attainment of optimal nutritional status for the population. The shortage of qualified staff remains acute; however, a food and nutrition policy has been formulated and should shortly be submitted for Cabinet approval. Three more food service supervisors have been trained and a breast-feeding campaign promoted.

Present goals are to develop the Nutrition Unit of the Ministry of Health by staff recruitment and by establishing

local training programs, to implement the recommendation of "A Strategy and Plan of Action to Combat Gastroenteritis and Malnutrition", to provide inservice training of health personnel, to promote the formal teaching of nutrition in schools of nursing and agriculture, and to improve the dietary services of institutions.

The appointment of a PAHO nutritionist will facilitate the organization, in collaboration with the Zone and CFNI, of a local training program for community nutrition workers - the most important development in the strategy to strengthen nutrition services. The nutritionist will also be able to assist with the promotion of the other program goals.

GUYANA-1600, DENTAL HEALTH

There is a shortage of professional dental personnel in both the private and public sectors, and the maldistribution of such personnel compounds the problem of lack of dental services, particularly for the rural and child populations. In order to improve this situation, the Government has decided on a program to train auxiliary personnel.

The purpose of the project is to improve the dental health of the community and to extend services beyond the urban areas. Present goals are to initiate the training of

dental auxiliaries in a two-year program, to continue recruitment and training of dental aides, and to promote dental health education in the school health program. Further technical advisory services are required as well as supplies for the restablishment of the Training School and Fellowships for the training of such personnel as the dental maintenance.

GUYANA-2100, WATER AND SEWERAGE CORPORATION

The purpose of this project is to prepare economic and technical feasibility studies on supply of potable water to Georgetown, and on sewerage and storm drainage for Georgetown, New Amsterdam, and Linden, as well as to provide appropriate management assistance.

The Draft Agency Terminal Report has now been completed and submitted. It includes the above studies, as well as several short-term consultants' reports.

GUYANA-3101, STRENGTHENING VETERINARY SERVICES

The purpose of this project is the strengthening of veterinary services with the establishment of a veterinary diagnostic laboratory to increase disese surveillance and notification. This is a cooperative activity between CIDA, IBRD and PAHO.

GUYANA-3100, VETERINARY PUBLIC HEALTH

Active review of the veterinary public health program is currently taking place. A PAHO fellow will return shortly as a qualified pathologist. A revised project document for the strengthening of the veterinary diagnostic laboratory services awaits final approval by UNDP.

The purpose of the project is to improve health and nutritional standards of the population by strengthening the recently established Veterinary Public Health Unit and developing a veterinary diagnostic laboratory. Present goals are elimination of the prevalent zoonoses in man and reduction in animals, establishment of a veterinary diagnostic laboratory, maintenance of epidemiological surveillance, improvement of the standard of food hygiene, and training of personnel.

GUYANA-4100, NURSING SERVICES

The need to plan for nursing requirements and resources to provide coverage according to levels of patient care has been recognized. A patient-centered nursing activity study has been completed and the report is being prepared.

The process of implementing written nursing care standards for the hospitalized patient has been initiated. A five-day workshop for senior nursing personnel was held during which the standards developed for the Caribbean were

reviewed and modified to meet local needs. A committee has been formed to begin implementation of the standards. The basic nursing education and the basic midwifery programs are being modified to include additional content in community health nursing.

The purpose of this project is the organization and development of nursing as a system, as defined in the National Health Plan. PAHO/WHO will provide training fellowships and consultant and advisory services in planning nursing needs.

GUYANA-5000, PROGRAM PLANNING AND GENERAL ACTIVITIES

The dimension of the problems of the health services is such that continuous planning and coordination of effort between the health and economic development sectors is necessary in quest of viable solutions.

The purpose of the project is to mobilize support at the highest level of national planning so that adequate financial and technical advisory resources can be made available to improve the quality and coverage of the health services.

PAHO/WHO's cooperation is essential to stimulate the planning process and to coordinate internal mechanisms for such international assistance as may be required to

supplement the national effort.

GUYANA-5100, DEVELOPMENT OF HEALTH SERVICES

The National Health Plan defines proposals for the development of the health sector and identifies health program priorities. Emphasis is on the qualitative and quantitative improvement of the health services, particularly through better utilization of available resources and integration of preventive and curative services. Priorities include strengthening of the health services, mainly in the rural and remote areas; development of human resources; strengthening of maternal and child health services, improvement of the management of the health services; control of communicable diseases; improvement of the nutritional status of the population; and stimulation of community participation in the health services.

The purpose of the project is to improve the health status of the peoples of Guyana, with emphasis on those in the rural and marginal areas of the country, through specific projects. PAHO/WHO cooperates with technical advice and training of personnel both locally and abroad in specific fields.

GUYANA-5500, MANAGEMENT OF HEALTH SERVICES

The objectives of the project are to assist the

Government to improve the health care services by strengthening the supporting accounting services in charge of the Central Accounting Branch of the Ministry, and by keeping medical equipment and buildings in a serviceable condition, thus maximizing the life of these resources.

The principal targets for 1976 are to automate the monthly payroll, the bank reconciliation work and other amenable operations fo the Central Accounting Branch and to prepare a proposed manual or organization and procedures for the operation of a maintenance unit that would be under the control of the Ministry of Health.

JAMAICA

JAMAICA-0700, AEDES AEGYPTI ERADICATION

The purpose of this project is to assist the Government in undertaking a national program to eradicate the Aedes aegypti mosquito from the country. During 1975 the preliminary activities were accomplished according to previous plans, and the program entered the attack phase in Regions I and II, with Regions II and IV still in the preparatory phase.

JAMAICA-1500, MENTAL HEALTH

Mental health is a priority area for the Ministry of Health and Environmental Control. The major areas of concern are the limited accessibility of the total population to psychiatric services, the lack of trained staff for the provision of effective hospital care, and the outdated mental health law.

The objectives of this project are the upgrading of psychiatric care through training of mental health personnel, regionalizing psychiatric care, and rehabilitating long-stay patients in Bellevue Mental Hospital.

JAMAICA-2000, WATER SUPPLIES AND ENVIRONMENTAL SANITATION

Problems of water supply, waste disposal and pollution are typical of areas undergoing rapid urbanization and industrialization. Existing institutions need to upgrade their organization to cope with more complex problems of the environment. As the country plans to improve urban and rural water supplies, the water agencies need to develop more efficient management and organization to stay in a viable position vis-a-vis the lending agencies.

There is need to develop the country's capability to monitor the total environment and implement more systematic water, air pollution, occupational health and industrial

waste management programs, to promote a more comprehensive approach toward training of environmental health personnel, and to provide proper leadership and coordination between agencies.

This project aims to develop an organizationl plan for a department of environmental control; to develop new, and improve existing programs in waste water management, water and air pollution monitoring and control, and occupational health; and to develop adequate institutional management for water agencies and a more comprehensive approach toward training of environmental health personnel. The project also provides for proper coordination between agencies and leadership in the environmental sector.

JAMAICA-2100, WATER AND SEWER ADMINISTRATION

The National Water Authority was formed by the Government of Jamaica in 1963. Its responsibilities include the study and recommendation of water schemes for the island; planning, designing and constructing all approved schemes; operating water systems which supply bulk water to parish councils; advising the parish councils on matters relating to the management of water systems; and developing programs to ensure adequate water quality throughout the island.

The scope of work performed by the Authority since its formation has grown considerably. Approximately US$50 million of projects are in the planning stages. These programs include projects funded by the Government of Jamaica and those funded by international agencies such as IDB and CIDA. In addition, since 1968 the Authority assumed responsibility for operating a sewage treatment plant in Montego Bay, as well as a number of small package plants. On 1 April 1973 it was also assigned the responsibility for planning, designing and constructing irrigation systems.

JAMAICA-3100, VETERINARY PUBLIC HEALTH

The purpose of the project is to cooperate with the recently established Veterinary Public Health Unit in establishing functional parish units relating to the zoonoses, to meat and milk hygiene, and to animal disease surveillance at slaughter, and to investigate problems as they arise; to assist in improving meat and poultry inspection; to improve veterinary laboratory diagnostic services; to develop and train animal and veterinary public health assistants; to eradicate brucellosis and animal tuberculosis by 1980 through diagnosis and slaughter of infected animals; to reduce leptospirosis through control of vector and animal reservoirs; and to prevent the entry of

diseases exotic to the country through maintenance of strict control of animal importation, animal products, sea stores, and aircraft food galleys.

JAMAICA-3300, ANIMAL HEALTH

This project will continue to develop a national animal health and veterinary public health program. An animal health assistant inservice training program will give further training to 12 graduates of the Jamaica School of Agriculture. Eight students will attend the Regional Center for Animal Health Assistants in Guyana. Five public health inspectors will be trained in meat hygiene in the United States of America. Two will receive six-month rodent control training in the Philippines and in Hawaii and Colorado, United States of America. The animal tuberculosis and brucellosis control and eradication project will continue on a parish-by-parish total herd coverage basis. The Veterinary Public Health Unit, assisted by a technical advisor in meat inspection planning, will improve meat hygiene, coupled with continuing planning to improve abattoirs. Rodent damage assessment and control methods will be developed. Veterinary laboratory management will by strengthened to improve service to clinical and preventive field programs.

JAMAICA-3600, CARIBBEAN REGIONAL DRUG TESTING LABORATORY

The health authorities of the countries of the Caribbean region are greatly concerned over defective drugs being distributed. These not only defeat the physician's efforts to treat, but may directly injure the patients. A considerable amount of money is being spent in the region on drugs which have not been properly tested for quality. Jamaica, Barbados, Guyana, and Trinidad and Tobago have government laboratories which test drugs by chemical procedures. They do not, however, have the capability of testing by microbiological or pharmacological procedures.

The purpose of this project is to help the Caribbean countries to organize a Caribbean Regional Drug Testing Laboratory responsible for performing microbiological or pharmacological tests, thereby complementing the existing national chemical analytical laboratories. The services of this regional laboratory will be available to all the countries of the Caribbean region.

JAMAICA-4300, EPIDEMIOLOGICAL SURVEILLANCE

PAHO/WHO cooperated with the Government in strengthening its epidemioloical surveillance of certain viral diseases.

JAMAICA-4500, REHABILITATION

Prior to 1972 there were no facilities for training, supervision, and placement of graduate physiotherapists in the Caribbean islands. The rehabilitation project commenced in May 1972 at the Mona Rehabilitation Centre, with the cooperation of the Kingston University Hospital and the Faculty of Medicine, UWI.

The objectives of the project are the establishment of a school of physiotherapy for the training of personnel selected from the islands of the Caribbean and Guyana, and the preparation of national tutorial staff to train 50 physiotherapists by 1977. Up to August 1975, 46 students had joined the school (16 in 1972, 14 in 1973, and 16 in 1975). The second- and third-year students have completed their theoretical studies and have initiated their field practice in different hospitals in Jamaica.

PAHO/WHO has provided technical assistance through a physiotherapist assigned to the project, teaching aids and supplies.

JAMAICA-5000, PROGRAM PLANNING AND GENERAL ACTIVITIES

The administrative structure of the Ministry of Health and Environmental Control is rather complex and there are fields where the administrative and technical responsibilities are not always clearly defined. At the

peripheral level, the role of the parish councils in public health matters and of regional boards for hospitals maintains the separation between preventive and curative medicine, which is conducive to duplication of efforts and dilution of responsibility. Environmental protection and pollution control in Jamaica are fragmented over a large number of ministries and agencies.

The objectives of this project are to assist the Government in the establishment of a national system for health care delivery, with particular emphasis on the extension of coverage of primary health services; to assist the Ministry of Health and Environmental Control in the establishment of a national program for environmental control, including veterinary public health; and to strengthen subregional programs (Caribbean Regional Drug Testing Laboratory).

The documents entitled "Medicare for Jamaica" and "Evaluation of the Ten-Year Health Plan" constitute the first step in the formulation of a national health policy, namely establishing the basis for a national system for delivery of primary health care (health planning process).

JAMAICA-5100, DEVELOPMENT OF HEALTH SERVICES

The most unfavorable factors in the proper development

of health services are the lack of systematic planning and trained personnel at almost every level of the technical and administrative branches of the health service.

The present objectives of this project are to identify the management implications of the proposed Medicare program as outlined in the official "green paper" and to assist in the development of a new organizational structure and systems of management in keeping with this program; to provide consultant services for improving the administration of the Ministry of Health; to assist the Government in the implementation of the maternal and child health, nutrition and family planning program; to develop a national epidemiological surveillance system, including malaria; to implement a community program for domiciliary care of leprosy patients; and to assist the Government in the development of a comprehensive human resources program in accordance with the country's needs.

PAHO/WHO has been providing technical assistance through permanent personnel assigned to Jamaica, short-term consultants, fellowships, and technical and economic assistance for the development of local courses.

JAMAICA-5200, MEDICAL CARE AND HOSPITAL ADMINISTRATION

The Government of Jamaica is seriously considering a

working document, submitted by the Minister of Health and Environmental Control to the Cabinet, on the introduction of a Medicare system based on social security plus public health integrated in one scheme. This program not only implies wider coverage of the population in terms of provision of health services, but involves the decentralization of authority to the regional hospital boards to enable them to have greater control over the management of their services. This will require more trained health managers; a more efficient and relevant information system, particularly in medical records; the establishment of an efficient system for the maintenance of health facilities; and the development of a sound administrative system within the health units.

The specific objectives of this project are to assist in developing an efficient and effective system of hospital administration, with emphasis on training of administrators, in keeping with the Government's Medicare program; to assist the University Hospital of the West Indies in the development and implementation of its inservice training programs; to continue the guidance and assistance provided to the Minstries of Health and Works on the organizing, staffing and functioning of an adequate health facilities

maintenance unit, which should be relocated from the Ministry of Works to the Ministry of Health and Environmental Control; to assist in designing and conducting on-site and job-related training of staff at artisan, clerical ad supervisory levels; to introduce maintenance systems, including the appropriate use of personnel and supplies, at selected government hospitals; and to strengthen the medical records system within government hospitals.

JAMAICA-5401, BIOSTATISTICS EDUCATION (This project was formerly Jamaica-6700)

It is recognized by the health authorities that the lack of trained personnel in medical records and health statistics has placed a major constraint on the development of a health service information system.

The purpose of this project is to assist the local authorities in the ongoing training program at a local established educational institution (College of Arts, Science and Technology). At present, only the first-level program leading to intermediate-level preparation in health records and statistics, through a one-year course for 18 students, has been accomplished; however, this is to develop into a second-year diploma level (in 1976) to qualify

personnel for senior positions in the system, and to develop national capacity to operate the program without external assistance as of academic year 1978-1979. It is anticipated that the need for a third-year certificate level for higher officials in the system will arise. With the development of this training program a graded career structure will also evolve. Attempts are also being made to upgrade medical records staff in the field by providing inservice training programs through seminars or workshops.

JAMAICA-5500, MANAGEMENT OF HEALTH SERVICES

The objectives of this project are to identify the management implications of the proposed Medicare program for Jamaica; to assist in the development of a new organizational structure and system of management in keeping with this program for their improvement.

The main focus has been on the role and function of the Head Office of the Ministry of Health and Environmental Control in the context of a decentralized regional system of health care. Considerable emphasis is being placed on the development of efficient and effective administratie support services in supplies, budget and accounting, and personnel management.

Collaboration is provided through consultant services

in the design and implementation of management systems and training programs, including fellowships.

JAMAICA-6400, SANITARY ENGINEERING EDUCATION

The purpose of this project is to assist the Government to alleviate the shortage of personnel in the fields of water supply and environmental health through a series of short courses. The project is also intended to institutionalize a training program in environmental health at the School of Public Health of the UWI and the College of Arts, Science and Technology (CAST). The objectives of the project have been widened in scope to include the development of a national program of training for water works personnel and the development of a water technical school at CAST. The implementation of this part of the project depends on external funding.

JAMAICA-7400, HEALTH CARE FACILITIES MAINTENANCE

The Ministry of Health and Environmental Control has up to now lacked the realization and facilities to provide desired maintenance to an extensive system of health care installations, estimated to be valued currently at J$70 million and with a replacement value of perhaps more than double that figure. Even though some assistance has been extended over the past two years, the level of accumulated

deferred maintenance is not being reduced, and newer facilities are in some cases falling prey to the same neglect.

The pupose of this project is to continue and extend the guidance and assistance of the type heretofore provided, with the objective of reversing the trend toward deterioration and improving health care facilities of the Ministry.

TRINIDAD AND TOBAGO

TRINIDAD AND TOBAGO-2000, ENVIRONMENTAL SANITATION

The basic environmental sanitation problems of the country are the lack of trained personnel, outdated laws, lack of environmental quality standards in areas of water quality, solid wastes management, air pollution control, food establishment regulation, and sewerage, as well as in other aspects of public health engineering and environmental health.

The objectives of this project are to provide training through academic and short-term fellowships and the establishment of standards and the fostering of legislation in the several priority areas of concern. The targets of

activities are specific in design, thus making progress evaluation merely a matter of maintaining a schedule of logical steps toward the accomplishment of the target.

TRINIDAD AND TOBAGO-2100, STRENGTHENING OF TRAINING UNIT OF WATER AND SEWERAGE AUTHORITY

The Water and Sewerge Authority (WASA) of Trinidad and Tobago, with a staff of approximately 3,000 is expanding and improving its facilities to provide additional water services to the public and to increase the efficiency of collection and disposal of waste water.

This three-year project is aimed at developing a more comprehensive training program and introducing and emphasizing practical aspects. Demonstration laboratories, workshops and pilot plant test areas are to be built and equipped, with top management, supervisory and engineering personnel, and plant and field operating level employees all becoming involved to some degree in the planning, scheduling and/or instructional aspects of the training program. In addition, the training facilities will be available to other water authorities in the Caribbean area, through joint efforts of WASA, CIDA and PAHO/WHO.

TRINIDAD AND TOBAGO-3100, VETERINARY PUBLIC HEALTH

The problem of animal diseases, especially those

transmissible to man, has faced Trinidad for many years. Due to a shortage of professional medical officers, the almost complete absence of trained assistants, and the limited laboratory diagnostic facilities and capabilities, little has been done in quantifying or confirming suspected cases of zoonotic disease.

Preventive and control measures against zoonotic diseases have not developed at a speed and in a manner likely to have significant effect on the incidence of these diseases. Lack of infrastructure, including field research, inadequate collaboration, and under-exploitation of the multidisciplinary approach to public health problems, have been largely responsible for this situation.

The purpose of this project is to support the newly established Veterinary Public Health Unit of the Ministry of Health and to assist in developing effective programs for the prevention, control and eradication of animal diseases, with emphasis on those transmissible to man. The objectives are a dynamic Veterinary Public Health Unit stffed with suitably trained personnel for the prevention, control and eradication of animal diseases, the development of food protection programs, and the promotion of and assistance in veterinary medical education which will reduce the incidence

of the zoonoses, improve animal health, and contribute to the overall economy of the country. By the beginning of 1976 the first group of veterinary public health assistants should have been trained, as part of the animal health and veterinary public health training program. The project will assist in developing the infrastructure within the Ministry of Health that will enable this newly created cadre of staff to make a meaningful contribution to food hygiene.

TRINIDAD AND TOBAGO-4300, EPIDEMIOLOGY

With expansion of facilities at the national public health laboratory and establishment of the Epidemiological Unit and the Caribbean Epidemiology Center, epidemiological surveillance has been greatly strengthened. Reporting of specific infectious diseases by telephone to the Epidemiological Unit by sentinel physicians has been instituted as a pilot for the Caribbean.

Compulsory immunization for poliomyelitis and smallpox has been continued and is mandatory before admission to primary school. The Government has recently introduced similar regulations for vaccination against diphtheria and tetanus. Control of food handlers through annual compulsory medical examination and registration, with improved surveillance of typhoid cases and carriers, has been

continued.

In the insect vector control program malaria vigilance is maintained. Reinfestation with Aedes aegypti has caused considerable concern and its control continues at a cost of nearly US$500,000 a year, which will be increased.

Tuberculosis control is maintained on ambulatory lines; BCG is offered to all primary school entrants and revaccination will be provided for those leaving school. Institutionalized treatment of leprosy is actively discouraged. Diabetes, hypertension and accident prevention have been given increasing priority. The Government has recently initiated a widespread program in order to combat venereal diseases, and control and treatment are being strengthened through improved health education, contact tracing, and early treatment. A screening program for cancer of the cervix uteri has been continued.

The purpose of this project is to assist in further improvement of epidemiological surveillance and disease control through consultants and fellowships in immunization, laboratory practices, venereal disease control, insect vector control, accident prevention and cancer registry.

TRINIDAD AND TOBAGO-5000, PROGRAM PLANNING AND GENERAL ACTIVITIES

The Third Five-Year Plan outlined a development strategy for Trinidad and Tobago in which priority was assigned to education and training of personnel in all sectors of public administration. The problems of major concern in the health sector are those related to deficient environmental sanitation; the extension of coverage of medical care services, and the development of teaching institutions for auxiliary health personnel.

The purpose of the project is to advise the Government in planning, improving, managing and evaluating the resources allocated to the provision of health care services.

TRINIDAD AND TOBAGO-5100, DEVELOPMENT OF HEALTH SERVICES

The basic problems of the health services in Trinidad and Tobago are shortage of trained staff, inefficiencies in the planning and management of health care programs, inadequate maintenance of health services facilities and equipment, and unsatisfactory evaluation of the health services.

The purpose of the project is to advise the Government in defining a clear health policy and program and in promoting a more efficient system for delivery of health services, bearing in mind the need for improved quality and

increased coverage, especially to the rural and underserved population.

TRINIDAD AND TOBAGO-5200, HOSPITAL ADMINISTRATION AND MEDICAL RECORDS

Fellowships were provided in order to cooperate with the Government in the development of its hospital administration program.

TRINIDAD AND TOBAGO-5400, HEALTH STATISTICS

The purpose of the project is to provide relevant, reliable and timely information for management, planning and evaluation of health services. Health records and statistics are at an early stage of development. However, some progress has been made. Priority has been given to the statistics of inpatient morbidity, immunization and communicable disease. Out-patient clinics, casualty departments and ambulatory care services do not have effective information systems. Registration of vital events is also experiencing difficulty. There is considerable potential for change.

Results obtained to date include increased Ministry interest in an improved communicable disease reporting system and the establishment of the Caribbean Epidemiology Center; review of legislation pertaining to medical records

agreement with regard to reallocation of registrars; consideration of medical records and statistical staffing infrastructure; signing of an IDB loan agreement which provides for two short-term consultants in medical records; the return of two Ministry of Health employees from the College of Arts, Science and Technology; and proposal of a candidate for a course in health statistics. Evaluation has been built into the project in the form of targets to be achieved and personnel performance evaluation.

TRINIDAD AND TOBAGO-5500, MANAGEMENT OF HEALTH SERVICES

This general management services assistance project provides specific support in four areas. First and most important is the program for continuing education in the management of health services. Second, the project assists in refining management techniques in the Ministry of Health with particular attention at this time to long-term financing plans for health services. Third, the project works in cooperation with the UNDP Administrative Improvement Project. Fourth, the project contributes to the development of infrastructure in areas required by other programs.

TRINIDAD AND TOBAGO-6500, DEVELOPMENT OF CURRICULUM FOR ANIMAL HEALTH ASSISTANTS

In order to diversify the economy, the Government has given priority to the modernization of the agricultural sector, including the expansion of the livestock industry, and is attempting to reduce the food import bill, especially for meat, and meat and dairy products. The expanding livestock industry is hampered by the lack of trained animal health assistants to aid the scarce veterinarians in the implementation of disease control programs. Many of the necessary training facilities already exist at the Eastern Caribbean Institute of Agriculture and Forestry, and the incorporation of animal health assistant training will increase the utilization of this facility. The broader-based veterinary service created by a corps of animal health assistants will enable problems such as bovine rabies, tuberculosis and tick-borne diseases, hog cholera and poultry diseases to be more easily solved, and in so doing increase the country's self-sufficiency in animal protein.

The purpose of the project is to develop a cadre of animal health and veterinary public health assistants for staffing the infrastructure within the respective ministries of agriculture and helth, and thus to better utilize th services of the veterinary professionals and to implement effective disease control or eradication programs.

TRINIDAD AND TOBAGO-6600, TRAINING SCHOOL FOR DENTAL NURSES

The incidence of dental caries is very high, particularly in schoolchildren. The dentist/population ratio is low and there is very little likelihood of providing any sizeable increase in the number of dentists within the next five years. To improve this situation it is imperative that support be provided for the scarce professional by training a cadre of allied health professionals capable of undertaking simple dental procedures. Following Cabinet approval, a school of dental nursing is scheduled to be opened in the near future.

TRINIDAD AND TOBAGO-7400, HEALTH AND MAINTENANCE SERVICES

The purpose of this project is to cooperate with the Ministry of Health in improving its administrative and financial systems and upgrading the technical and professional personnel who would be responsible for administering and operating the program to be financed by a loan from IDB.

Consultants are being provided in the fields of training in medical records, nursing, and hospital maintenance.

WEST INDIES

WEST INDIES-0700, AEDES AEGYPTI ERADICATION

The Aedes aegypti mosquito is present in all of the islands of the West Indies, thus exposing all of them to the risk of outbreaks of yellow fever, dengue and hemorrhagic dengue. Because of heavy inter-islands traffic, there is also the risk of transportation of the vector from island to island. All of the islands except St. Kitts-Nevis have eradication campaigns under way. The project was started in 1970; its goal is to eradicate Aedes aegypti from the West Indies, and on achieving eradication to maintain the islands free of the vector.

Targets for the budget period are to continue efforts to implement a campaign in St. Kitts-Nevis in 1976; and to try to complete the attack phase in the other islands by the end of 1977. During the same period, emphasis will be placed on the education of the communities concerning this problem, in an endeavor to increse support and participation.

WEST INDIES-1301, FAMILY PLANNING PROGRAM (ST. KITTS/NEVIS)

The purpose of the project, in operation since 1971, is to assist the Government in making family planning services available to the population within maternal and child health

services. Six clinic locations offer specialized family planning services, and supplies are available in each health center. There are 2,000 active acceptors in the program.

PAHO/WHO has provided assistance with planning, training of personnel, and procurement of equipment and supplies. Plans for the future include extension of services to 10 clinics and the establishment of a special center for adolescents.

WEST INDIES-1302, HEALTH AND POPULATION DYNAMICS (ST. VINCENT)

The Government of St. Vincent is concerned about high maternal mortality (1.8 per 1,000) and high infant mortality (100 per 1,000) as well as the health consequences of unchecked fertility, particularly in view of the large proportion of high-risk pregnancies among mothers and the high incidence of prematurity and malnutrition among infants and children. The purpose of the project is to develop family planning services as an integral part of a strengthened maternal and child health program.

WEST INDIES-1303, FAMILY PLANNING PROGRAM (DOMINICA)

The project in Dominica is part of a comprehensive maternal and child health and family planning program. Services are presently available in five health centers.

Later, they will be extended to five additional clinic centers and 10 supply centers. The number of active acceptors has passed 2,000.

PAHO/WHO has been instrumental in program planning development, training personnel, and procurement of equipment and supplies. Future activities will be centered on the further extension of services, continued training and development of community education.

WEST INDIES-1304, MATERNAL AND CHILD HEALTH (CAYMANS)

The objectives of the preparatory project are to complete the survey of the maternal and child health situation and the resources available for maternal and child health services in the Cayman Islands and to formulate a long-term (5-10 year) plan for the strengthening of maternal and child health services.

WEST INDIES-1400, NUTRITION

According to available data, the major nutrition problems in the West Indies are protein-calorie malnutrition of early childhood, relating problems of infectious diseases such as gastroenteritis, and iron-deficiency anemia. Prevalence of second- and third-degree malnutrition, as determined from clinical records, varies from 2.4 to 27.2%. There is a general lack of up-to-date reliable information.

The immediate objectives include continuation of nutrition education training for health and allied personnel; review of nutrition curricula in educational institutions, including nursing and agriculture; continued strengthening of the nutrition component in maternal and child health services; reorientation of coordinated nutrition programs; review and establishment of standards for food service; study and design of a feasible supplementary feeding program; and increased nutrition information through the use of mass media.

WEST INDIES-1500, MENTAL HEALTH

The purpose of this project is to promote in the English-speaking countries of the Caribbean the improvement of mental health services. Assistance is chiefly given through fellowships for study abroad in areas related to mental health.

WEST INDIES-2100, WATER SUPPLIES

The purpose of this project was to help improve the health and socieconomic conditions of the countries through the provision of adequate quantities of piped, safe water readily accessible to the user, from facilities operated and maintained by an organization with competency in planning, design, management, and sanitary surveillance of community

water supplies, giving due consideration to other essential uses of water resources.

WEST INDIES-2101, WATER UTILITY MANAGEMENT, DEVELOPMENT AND TRAINING

The long-range objective of this project, which covers several islands in the Caribbean, is to develop sound, self-sustaining institutions for planning, design, construction, operation and maintenance on an islandwide basis, of water works to supply the population with potable water to the extent recommended by the Ten-Year Plan for the Americas.

The immediate objective is to assist governments to strengthen their capability and improve operational capacity through the development of criteria, policies, systems, practices, and a manual of procedures in the areas of management, administrative services, economics and finance, and engineering.

The project will utilize, wherever possible, common solutions in the above-indicated work areas in order to take advantage.

WEST INDIES-2102, WATER ADMINISTRATION, PLANT OPERATIONS AND REGULATION (ANTIGUA)

There is no water treatment laboratory in Antigua. At present water analysis is carried out at the laboratory of

the General Hospital, which itself has no pathologist or bacteriologist. In the field of plant operations and administration there is no skilled staff to repair and maintain water meters and other equipment.

The purpose of this project is to improve the quality and extend the distribution of piped water. The objective is to train personnel in water administration and technicians to operate and maintain a good water supply system and its equipment.

WEST INDIES-2200, SOLID WASTE MANAGEMENT ADVISER (ST. LUCIA)

The purpose of this project was to cooperate with the Government in the planning and development of effective methods for the collection and disposal of solid wastes.

WEST INDIES-3101, MOBILE VETERINARY LABORATORY SERVICES

The purpose of this project is to cooperate in upgrading laboratory diagnostic services in the Associated States of Montserrat. During the three years of the project it is proposed to assist the governments in carrying out the following tasks: (1) activities to survey zoonotic, food-borne and parasitic animal diseses; (2) training of laboratory technicians and inservice training of animal health assistants; (3) preparation of a detailed long-range national animal health and veterinary public health program;

and (4) establishment of diagnostic laboratories.

WEST INDIES-4100, NURSING SERVICES

The purpose of the project is to assist the governments of the English-speaking countries and territories in the Eastern Caribbean to develop nursing programs which contribute to the achievement of national health goals.

WEST INDIES-4201, CARIBBEAN HEALTH LABORATORY SERVICES

The Caribbean Health Ministers Conference has been very concerned about the low level of development of health laboratory services in the region, particularly in the subregion comprising the less-developed countries. This has become a serious obstacle to the adequate delivery of care to the people of the area. The Conference, at its Sixth Meeting in the Bahamas in June 1974, adopted a resolution calling for a concentrated action by its Member States to resolve this problem in collaboration with United Nations multilateral aid agencies.

The purpose of the project is to carry out a systematic survey of the health laboratory services with a view to the establishment of a regional system of laboratory services that would sere the needs of clinical medicine, epidemiology and veterinary public health. Such a survey will involve a mission of consultants and laboratory technicians to carry

out specially designated surveys.

The long-range objective of the project is to improve health care by establishing specialized reference laboratories and providing a centralized system for maintaining them.

WEST INDIES-5100, DEVELOPMENT OF HEALTH SERVICES (LEEWARD ISLANDS)

The purposes of this project are the improvement of the standard of health care delivery for the population of the Leeward Islands through the optimal use of scarce human and financial resources; control of environemntal hazards; and development of the full potential of all health personnel. The project started in 1972.

WEST INDIES-5101, DEVELOPMENT OF HEALTH SERVICES (WINWARD ISLANDS)

The purpose of this project is to promote, advise and assist the Governments of St. Lucia, St. Vincent and Dominica to improve the delivery of health services to the population, and to achieve the goals of the Ten-Year Health Plan.

WEST INDIES-5200, MEDICAL CARE AND HOSPITAL ADMINISTRATION

The less-populated countries of the English-speaking Caribbean, which are either Associated States or colonies of

the United Kingdom (Cayman Islands, St. Kitts, St. Lucia, St. Vincent, Montserrat and Dominica), possess personal health care delivery systems which are in urgent need of improvement in the areas of organization, management and human resource development.

The purpose of this project is to assist these respective territories to improve their personal health care delivery services and standards of medical care through the development of modern organizational structures, management procedures and physical facilities, and the training of an adequate number of specific health care workers commensurate with each country's needs.

WEST INDIES-5201, HOSPITAL ADMINISTRATION (ANTIGUA)

The 210-bed Holberton Hospital is the only acute general hospital in Antigua (1970 population: 64,000). Realizing that present hospital legislation, administrative organizational procedures and human resources are unsatisfactory and are major constraints to the development of a more efficient health care facility, the Government is desirous of initiating the required changes which will assure an improved health care delivery system at the institutional level and improved standards of patient care.

The long range objective, initiated in 1972, is to

develop a modern and efficient hosptial organizational structure, staffed with qualified personnel; in order to improve the delivery of institutional health care and the standards of such care. Essential to the achievement of these goals is the provision of a sound legal basis for organizational and procedural changes, the improvement of human skills in all functional areas of operation, and the introduction of modern operational policies, procedures and techniques.

WEST INDIES-5400, HEALTH STATISTICS

The purpose of the project is to promote the development of health records and statistical services among the governments of the West Indies. Priority has been given to the development of manual systems and publication of the annual chief medical officer's report, but will now shift to fellowships which can provide the governments with the capacity to maintain these systems with their own personnel.

WEST INDIES-5500, MANAGEMENT OF HEALTH SERVICES

The purpose of this project is to provide assistance for increasing the operating capacity of the health services both at the central and institutional levels. Emphasis will be given to cooperation in developing the planning function for the improvement of the information system and for the

development of the administrative systems in priority areas selected by the governments.

Assistance will continue to be provided for the organization and introduction of training programs as required for institutional development.

WEST INDIES-6300, NURSING EDUCATION

The purpose of this project was to cooperate with the Government of Antigua in training personnel in public health nursing.

WEST INDIES-6302, DEVELOPMENT OF NURSING MANPOWER (TURKS AND CAICOS ISLANDS)

Fifty percent of the present nursing staff is untrained and there are no facilities for their present or future training. A local coure, initiated in 1974 for 10 clinical nurses, was completed in August 1975.

The objectives of the project are to train clinical nurses in hospital and community care; to establish a continuous in-service education program for all nursing personnel; to train one graduate nurse in advanced nursing administration; and to train one nurse in ward administration.

CARIBBEAN REGIONAL PROJECT SUMMARY

AMRO-0701, DENGUE SURVEILIANCE

During the last decade dengue has been endemic in the Caribbean, and several epidemic outbreaks have been reported from different countries. One of the most severe of these outbreaks occurred in Colombia in 1971-1972 producing an estimated 500,000 cases. The purpose of this project was to assist and collaborate in the implementation of the recommendations of the PAHO Scientific Advisory Community on Dengue.

This project has been incorporated into AMRO-1200.

AMRO-0710, AEDES AEGYPTI ERADICATION (CARIBBEAN)

With the exception of Bermuda, the Cayman Islands, Aruba, Bonaire, Saba and St. Eustatius, the remaining countries of Zone I are still infested with *Aedes aegypti*, vector of urban yellow fever, dengue and hemorrhagic dengue.

The yellow fever virus that prevails in enzootic and epizootic selvatic areas of South America was very active in 1975 with over 100 cases reoprted from Bolivia, Colombia, Ecuador and Peru. Dengue types II and III are endemic in the Caribbean area and in South America. An epidemic

outbreak of these diseases would produce adverse effects on the health and economy of the countries in Zone I, regardless of the nature of their sources of income. The majority of the countries in the Caribbean area are carrying out eradication campaigns, with varying degrees of success. A factor that endangers the favorable results achieved by many of the most successful and advanced campaigns is the increasing availability of various means of transportation. The ensuing heavy traffic (travel) contributes to the risk of dissemination of the mosquito from infested areas to places free from it, thus delaying the achievement of the final goal.

The purposes of this project are to give technical and advisory assistance to te countries of Zone I for the eradication of Aedes aegypti by collaborating with the campaigns which are under way, and to promote the initiation of campaigns in those countries still not engaged in eradication activities. In the islands free from Aedes aegypti the purpose is to assist, organize and implement vigilance services to prevent the reintroduction of the vector.

AMRO-1310, FAMILY HEALTH AND POPULATION DYNAMICS (ZONE I)

Under the reorganization of PAHO, Zone advisers will

shift their activities from assisting PASB staff in the development of projects and evaluation of results to emphasis on providing governments with consultant services in their fields of specialty within the geographic areas to which they are assigned. These consultant services will be provided, at the request of governments, through the country representative in each country.

AMRO-1401, NATIONAL FOOD AND NUTRITION POLICIES

The objectives of the project are to intensify or promote in the Latin American and Caribbean countries knowledge and understanding of problems of food and nutrition, their causes, evolution and biological and organic consequences, and their negative effect on economic activities and socioeconomic development; to help in the search for national short-, medium-, and long-term remedies and in defining the actions in which they should result; to urge governments to formulate and adopt food and nutrition policies, including them in their general plans for socioeconomic development and in their sectoral plans, and assigning appropriate priority to them among the objectives of national development; to contribute to interagency thought and analysis in respect of the problem of food and nutrition in Latin America and the Caribbean; and to secure

the integration of the activities carried out at the national level by the participating organizations as regards food and nutrition.

AMRO-1411, CARIBBEAN FOOD AND NUTRITION INSTITUTE

The major nutrition problem of the English-speaking Caribbean, protein-calorie malnutrition among children under five years, will become worse to an extent not yet determinable due to the world food shortages of 1973 and the steeply increased prices of basic food commodities. This crisis has emphasized the economic and nutrition vulnerability of the area due to excessive dependence on imported foods. It has, however, led to wider appreciation of the need for the formulation and implementation of national food and nutrition policies.

The CFNI was established in 1967 under the authority of PAHO/WHO, FAO, the UWI and at first two (and recently all) of the 16 English-speaking Governments of the Caribbean, whose peoples, ranging in number from 5,000 to 2,000,000, it serves.

The activities of the Institute have, as their objectives, goals closely related to those of the Ten-Year Health Plan for the Americas, namely, to establish a diagnosis of the food and nutrition situation of the

countries and maintain a permanent surveillance of its trends; to establish national food and nutrition policies; to strengthen/establish nutrition units in the relevant ministries; to train personnel at all levels for nutrition-related services; to improve programs for the diagnosis, prevention and treatment of nutrition diseases; to improve institutional food services; and to conduct research with particular emphasis on the evaluation of nutrition-related programs.

The project receives assistance from UNICEF, the Research Corporation of New York, and the Ford Foundation, as well as from the establishing authorities mentioned above.

AMRO-1600, DENTAL HEALTH

There is a high prevalence and incidence of dental disease in Latin America and a limited provision of preventive and curative dental services. There is also a shortage of dental personnel, both professional and auxiliary, as well as of effective systems to provide comprehensive dental services. The project has collaborated in the conduct of national dental health and manpower surveys in Venezuela, Colombia and Mexico and in the preliminary review of the delivery of dental services and

the situation regarding dental health manpower in the English-speaking Caribbean. A school for the preparation of dental auxiliaries has been established in Jamaica, and a further project is in the process of being implemented in Trinidad. The use of dental auxiliary personnel is commencing in other Caribbean countries and territories.

It is proposed to refine the methodology for conducting dental health surveys and to develop dental health planning, developing improved methods for the utilization of dental personnel and the application of preventive and curative measures. It is envisaged that through a combined approach involving use of auxiliary personnel, new systems of care delivery, and improved payment mechanisms and equipment, the range of services available to persons in Latin America will be expanded.

AMRO-2010, SANITARY ENGINEERING (ZONE I)

Under the reorganization of PAHO, Zone advisers will shift the emphasis of their activities from assisting PASB staff in the development of projects and evaluation of results to emphasis on providing governments with consultant services in their fields of specialty within the geographic areas to which they are assigned. These consultant services will be provided, at the request of governments, through the

country representative in each country.

AMRO-2100, WATER SUPPLIES (REGIONAL)

The water supplies and sewerage services program is oriented toward assisting the countries in the planning and implementation of their activities for supplying safe water and adequate sewerage disposal services consistent with the countries' economic and national development plans. Acceleration in the rate at which these services are provided, through increased assignment of national and international funds, is a key objective of this project. Loan development policy and the evolution of criteria and standards are areas in which the project assists the countries in generating sound bases for loan applications. In order to meet the Ten-Year Health Plan goals for water supplies and sanitation, an expenditure of US$10 billion is envisaged.

Emphasis is also directed toward improvement of existing systems in order to achieve greater coverage with less capital expenditure. Upgrading of the quality of drinking water, improvement of maintenance and operation, and reduction in unaccounted-for water are all included in the cost-effectiveness solutions which are developed through the assistance provided by this project

AMRO-2174, CARIBBEAN BASIN WATER MANAGEMENT PROGRAM

The purpose of this project is to assist the countries of the Caribbean to improve the quality of drinking water. The objectives of the program are to assist the countries in the Region in achieving the optimum level of drinking water quality consistent with their resources, capabilities, and needs through focusing greater attention on the bacterial quality of the drinking water and how it affects the user, and to undertake a series of conferences to develop guidelines for plans of action which can be used by the various agencies and ministries to develop the necessary programs and resources.

Further objectives are to assist countries in developing and implementing these plans of action and in developing and implementing project/programs to explore ways and means of obtaining improved water quality at the lowest cost and in the shortest time, consistent with existing and potential resources.

AMRO-3110, VETERINARY PUBLIC HEALTH (ZONE I)

Under the reorganization of PAHO, Zone advisers will shift the emphasis of their activities from assisting PASB staff in the development of projects and evaluation of results to emphasis on providing goverments with consultant

services in their fields of specialty within the geographic areas to which they are assigned. These consultant services will be provided, at the request of governments, through the country representative in each country.

AMRO-4172, STANDARDS IN NURSING PRACTICE

In view of the inadequacies in the delivery of health services in Latin America, the Ministers of Health established the goal of providing safe, minimal care to individuals in at least 60% of hospitals with 100 beds or over and 60% of community health centers. This recommendation was reinforced by Resolution XIII of the XXI Meeting of the Directing Council of PAHO, which refers to expansion of health srvices for total coverage of the community, together with maximum utilization of manpower.

Recognition of the need for governments to provide health care to the entire community, and of the key role nursing plays in the delivery of this care, in order to meet the program objectives of adequate and appropriate nursing services is endorsed by Resolution X of the 64th Meeting of the Executive Committee and Resolution XXI of the XVIII Pan American Sanitary Conference.

The purpose of this project is to assist countries of the Region to formulate standards for care of patients both

in the community and in the hospitals.

AMRO-4370, CARIBBEAN EPIDEMIOLOGY CENTER

The high rates of morbidity and mortality for communicable and noncommunicable diseases in the countries of the Caribbean constitute a priority health problem for disease surveillance and control programs.

The Caribbean Epidemiology Center was established on 1 January 1975 under the authority of PAHO/WHO. It incorporates the Trinidad Regional Virus Laboratory, previously run by the UWI. The Center is financed jointly by PAHO, the Caribbean territories attending the Conference of Health Ministers, and the British Government. In addition, the Center for Disease Control, Atlanta, Georgia, has provided additional funds throught the Caribbean Community Secretariat to help establish epidemiological surveillance throughout the Caribbean basin. The Medical Research Council of the United Kingdom and Rockefeller University, New York are actively participating in the reserach program.

The functions of the Center are (1) to serve as a specialized technical resource, particularly in the field of communicable diseases and their surveillance, and to cooperate in the programs being developed by the

governments; (2) to achieve a reduction of mortality and morbidity associated with communicable diseases in the area; (3) to act as a center for epidemiological surveillance for all countries in the Caribbean participating in, or cooperating with, the Center; (4) to assist ad advise governments in the surveillance, diagnosis, and control of communicable diseases; (5) to assess the resources and needs of laboratories within the area and assist in their development; (6) to promote collaborative relations with laboratoreis which may serve the area; (7) to provide selected diagnostic laboratory services and facilities needed for surveillance; (8) to provide training in epidemiological surveillance and laboratory diagnosis, and their field application, for personnel at various levels in health and other related services (9) to maintain facilities for the investigation of selected animal viruses; and (10) to carry out research both in the Center and in the field on disease problems important to the Caribbean.

AMRO-4410, HEALTH EDUCATION (CARIBBEAN)

Of a total of 16 Caribbean countries, 13 have established some type of health education services. Seven of these countries created their services during the last three years. In some countries health education services

are manned by individuals who are not yet professionally trained. In order to solve this situation, in 1975 the UWI started a training program in health education. Five countries have included relevant health instruction in their school curricula. All Caribbean Governments have expressed their interest in more community involvement in the development of health services. This pressing need has been highlighted during the recent meeting of the Caribbean Health Ministers Conference. In all countries the development of community and school health education services and programs shoul be intensified to benefit health programs by means of international assistance.

The objective of this project is to establish and/or consolidate effective health education services and programs in all Caribbean countries, both in communities and schools.

AMRO-5010, CARIBBEAN HEALTH MINISTERS' CONFERENCE

The purpose of this project is to cooperate in providing a secretariat for the Caribbean Health Ministers' Conference.

AMRO-5201, PLANNING AND ADMINISTRATION OF HOSPITALS

The purpose of the project is to expand the coverage of hospital services through an increase in medical care capacity, using present resources and restricting hospital

construction exclusively to replacement needs and essential new physical resources. An inventory of health establishments in the countries of the Region will be drawn up which will make it possible to analyze at the national level available resources and their degree of utilization. At the regional level, general technical and administrative standards for each type of establishment that may serve to guide the countries will be established. Assistance will continue to be given in the administrative improvement of hospitals, in particular local community hospitals because of their important responsibilities in supporting primary care services.

AMRO-5310, HEALTH PLANNING AND ORGANIZATION (ZONE I)

Under the reorganization of PAHO, Zone advisers will shift the emphasis of their activities from assisting PASB staff in the development of projects and evaluation for results to emphasis on providing governments with consultant services in their fields of specialty within the geographic areas to wich they are assigned. These consultant services will be provided, at the request of goverments, through the country representative in each county.

AMRO-5410, HEALTH STATISTICS (ZONE I)

Under the reorganization of PAHO, Zone advisers will

shift the emphasis of their activities from assisting PASB staff in the development of projects and evaluation of results to emphasis on providing governments with consultant services in their fields of specialty within the geographic areas to which they are assigned. These consultant services will be provided, at the request of governments, through the country representative in each country.

AMRO-5510, MANAGEMENT OF HEALTH SERVICES (ZONE 1)

Under the reorganization of PAHO, Zone advisers will shift the emphasis of their activities from assisting PASB staff in the development of projects and evaluation of results to emphasis on providing governments with consultant services in their fields of specialty within the geographic areas to which they are assigned. These consultant services will be provided, at the request of governments, through the country represenative in each country.

AMRO-6500, VETERINARY MEDICINE EDUCATION

In Latin America, the majority of the university centers for the training of veterinarians are insufficiently developed. There is a high dropout rate, for various reasons, in the early years of the professional curriculum, resulting in the graduation of less than 30% fo the number registering the first year.

The pupose of this project is to aid in the improvement of veterinary medical education in accordance with the needs of the countries through the training of professors and administrators of the schools in methods of curriculum revision, improvement of teaching/learning methods, and the organization of postgraduate and continuing education, thereby permitting the veterinarians to update their knowledge and improve their capacity. Organiztaion of programs for the training of animal health assistants ad strengthening of the physical and human resources will be carried out. Assistance will be provided to the schools in securing external financing for these improvements.

AMRO-6910, EDUCATION AND TRAINING OF PARAMEDICAL PERSONNEL (CARIBBEAN)

Ministers of Health of the English-speaking Caribbean countries, meeting annually since 1969, have identified te acute shortage of trained allied health (paramedical) personnel as central to the region's health manpower problem and one of the major constraints to the delivery of adequate health services.

This regional project has as its main objective the formation of allied health personnel, adequate in number and of appropriate quality, to meet the manpower needs of the

health services of the Commonwealth Caribbean countries. A multi-disciplinary approach will be utilized at postsecondary educational institutions throughout the region. The education and training of health workers to the aide, basic, and advanced levels, as well as the preparation of health sciences tutors, will be catered for. At all levels, preservice, inservice, and continuing education programs will be included.

AMRO-7400, HOSPITAL MAINTENANCE AND ENGINEERING

The majority of the countries of the Region have not yet established an effective policy with regards to maintenance of health facilities, which is important to protect the large investments made in construction, installations and equipment. Specialized personnel in hospital maintenance and engineering are scarce.

Through this project assistance is given to the countries to develop clearly defined maintenance policies, covering the assignment of specific resources and national organization to primary health care facilities, and in the organization of specific training programs and performance of tasks.

BARBADOS

Barbados is a coral island in the Eastern Caribbean. The island is tropical but because of its small size, 166 square miles, it has an equable temperature which varies from 75°F from late November to late February and 85°F from July to November. The terrain is gently undulating, with flat coastal areas and a number of higher areas reaching just over ',100 feet at one point. The rainfall varies between 45 inches in the low-lying areas to 80 inches on high ground he country has an estimated population (mid-1974) of 242,800, with a population density of approximately 1,466 per square mile

The country has one large town, the capital, Bridgetown, which has a population of 94,000. Road communications are excellent and, consequently, there is no differentiation between urban and rural population.

Formerly a British Colony, Barbados obtained complete independence in November 1966. The Government is constitutionally a Parliamentary Democracy with a bicameral legislature within the British Commonwealth The Head of State is the Governor-General as the Queen's Representative, the leader of government business is the Prime Minister.

The economy of the country is based primarily on tourism and sugar production, but strenuous attempts are continuing to be made to diversify and expand the agricultural base to include livestock and poultry farming, food crops and cotton. Steps to develop light industry are also proceeding The economic plans have been remarkably successful, and the estimated (provisional) gross national product in 1973 was BDS$426 million, giving a per capita gross national product of BDS$1,754 32, or US$877 16 (1974 provisional) Unfortunately, the cost of living is high and has worsened due to the current world inflationary situation The position has been aggravated by the unstable and mainly adverse performance of the pound sterling with which the Barbados dollar had parity at 1 BDS$4.80 To combat this, the Government of Barbados shifted the parity of the Barbados dollar to the US dollar at an exchange of US$1 BDS$2 00 from 7 July 1975. This is expected to stabilize and increase the purchasing power of the Barbados dollar

The Government has published a medium-term development plan 1973-1977 which has, among others, the following objectives. (1) diverrification of the structure of production, (2) full maximum employment of hum esources, and (3) greater economic self-sufficiency. This implies increased food production, modernization of the ..ear industry, promotion and intensification of light industry to expand exports of manufactured goods, and the contin levelopment of the tourist industry.

The Government recognizes the need to develop the ne essary infrastructure and administrative capacity, plans call for administrative reform in order to maximize the use of human and financial resources and to ensure effective coordination and control

In the health sector the principal aims are to improve the quality of health services provided and to extend the coverage of the population, to develop a comprehensive and integrated health care delivery system, and to improve the quality of environmental health including occupational health.

The health situation is reflected to some extent in the following health indices recorded in 1974 (provisional) The most recent estimate of life expectancy was 70 9 years for females and 65 5 years for males In 1974 the birth rate was 20, and the natural rate of increase was 11.3 per 1,000 population. The general mortality rate was 8.7 per 1,000 population, the infant mortality rate was 34 0 per 1,000 live births, the death rate in the 1-4 year age group was 1 3 per 1,000 population, and neonatal mortality was 20.4 per 1,000 live births Communicable and notifiable diseases caused 2 65% of all deaths

There are 700 acute general hospital beds in the country--600 at Queen Elizabeth Hospital and 100 at St Joseph Private Hospital, 35 beds are available at two maternity district hospitals Long-stay hospital beds amount to 1,491 700 in the Mental Hospital and a total of 791 in five district hospicals This gives a ratio of 28 acute beds, 28 psychiatric beds, and 316 chronic beds per 10,000 population. The latter cater mainly to geriatric patients

lped water is accessible to 100% of the population--64% have water through house connections and 36% have easy access o water.

The estimated mid-1974 population structure revealed that 37 02% of the population were under 15 years of age and 11% were under five years, 8% of the population were over 65 years of age

The annual national government expenditure in 1974 was BDS$138,625,305, of which $27,325,741 was allocated to health, representing 20% of the national budget and a per capita expenditure on health of BDS$113 00, or US$56.50.

It is the intention of the Government to set up a full-time planning unit in the Ministry of Health, and two posts--health planning officer and assistant health planner--are provided in the estimates The post of assistant health planner has been filled, and attempts are being made to fill the senior post

Efforts will be made to achieve the Government's adjusted goals of the Ten-Year Health Plan for the Americas. It is planned to extend and to improve the quality of health care delivery to all citizens of the country and to prepare for the introduction of a national health service. Emphasis will be placed on integration of all health services so that every aspect of health care can be provided locally, as far as possible, and based on the actual health needs of the community as a whole

Specifically, the Government has indicated its commitment to strengthening of epidemiological surveillance; institution of technical and administrative reforms, and increased coordination between the elements within the Ministry of Health and its institutions, as well as between these and other sectors whose functions have a bearing on health

It has been noted that although vital statistics show, in general, a good picture, there is evidence of high neonatal and infant mortality and considerable demand for hospital and outpatient care for gastrointestinal infections and parasitic infestations. Respiratory infections and venereal diseases also show a high demand rate Tuberculosis morbidity and mortality could also be regarded as higher than one would expect at this time. Aedes aegypti is still present, although the index is below 1%.

Active maternal and child care services are rendered at the health centers throughout the country and at the Queen Elizabeth Hospital and district hospitals There is a voluntary Child Health Committee which renders valuable service and a very active Family Planning Association which is financed by the Government, the International Planned Parenthood Federation, UNDP and UNFPA, although it functions as a voluntary autonomous body

A Government-operated national nutrition center efficiently monitors the nutrition status of children. The Government has expressed a desire to revive a project in conjunction with PAHO/WHO which would assist in the training of much-needed personnel in this field

The country has one mental hospital with 700 beds The patients, however, include certain categories of geriatric and indigent patients which unnecessarily strains the limited staff There has been much activity in this field aimed at improvement of the central and district psychiatric services, with increasing emphasis on reducing the admission rate, increasing outpatient treatment, separating the geriatric from the mentally ill patients, and setting up of an acute psychiatric unit at the Queen Elizabeth Hospital

Lack of human resources is causing severe dental health problems. Nevertheless, school dental clinics and dental outpatient clinics are held at various centers Although at present mainly extractions are being done, the Ministry is aware of the need for increased preventive dentistry, and an effort is being made in this direction

The Government has given high priority to improvement in environmental health. To this end, it has entered into agreements with PAHO/WHO and UNDP for a number of important projects which are in operation In solid waste disposal the Government has invested in excess of BDS$2.5 million for vehicles and heavy machinery, and UNDP/PAHO have provided funds and technical expertise for the operation of the project. A PAHO/WHO-recruited project manager has been appointed and assumed duties recently, and funds are provided for training of a manager and deputy manager.

Water supply is dealt with by the Water Works Department, which has been working with PAHO/WHO assistance to strengthen its administrative and organizational structure and operations. A Public Health Engineering Unit has been set up in the Ministry of Health. This Unit is fully engaged in the preliminary studies for a Bridgetown sewage disposal system which will be financed by funds negotiated by the Government with the IDB. The present stage of the project is supported by UNDP with special reference to a PAHO/WHO recruited sanitary engineer and funds for the training of staff and for technical consultants.

Leptospirosis has been an important problem in animals and, to some extent, in man. Brucellosis is also considered to be a problem Because of this, the Government entered into an agreement for a project for the protection of animal and human health. The project is UNDP-financed and PAHO/WHO executed. Funds have been provided for one project manager-veterinary pathologist, one veterinarian, and one biologist, as well as for equipment and supplies, consultants and fellowships. The project is proceeding very well, with four main thrusts: (1) development of a veterinary diagnostic laboratory and improvement of the Medical Laboratory in the diagnosis of the zoonoses, (2) island-wide rodent control; (3) island-wide survey of livestock for leptospirosis and brucellosis; and (4) massive health education in the field of animal and human health.

There are weaknesses in the fields of district and public health nursing, laboratory services, radiology, and public health inspection. In all these areas the main problems are shortage of human resources and the need for training opportunities.

The Government has recognized the need for efficient organization and administrative support for the technical activities in order to improve health standards. It has begun a careful review of present organizational structure and administrative practices with a view to improving overall efficiency. In this connection it has been participating in a PAHO/WHO-sponsored course in administration of health services which commenced in November 1973 and has already held three seminars The fourth and last is expected in 1976.

The Government is committed to the establishment of a Health Planning Unit in the Ministry of Health, which will work closely with the National Planning Unit. There have been difficulties, however, in obtaining and retaining the services of health planning officers. A senior health planning officer held the post for a short time and resigned. An assistant health planning officer was later appointed and has recently submitted her resignation. The difficulty seems to be the question of the concept of the duties of such officers.

The Ministry of Health has a central statistical officer and a Department of Medical Records at the Queen Elizabeth Hospital. There is, however, room for better coordination in the field of health statistics and information systems.

The development of human resources is an area of serious weakness in Barbados as in other Caribbean countries. The human resources position in the health sector is as follows:

Number of Health Personnel with Ratios per 10,000 Population, 1973 and 1974

CATEGORY	1973		1974	
	Number	Rate	Number	Rate
Doctors	160	6.7	160	6.6
Dentists	16	0.7	16	0.7
Hospital Administrators	2	0.1	2	0.1
Veterinarians	5	0.2	5	0.2
Sanitary Engineers	1	0.0	1	0.0
Health Educators	1	0.0	1	0.0
Social Workers	4	0.2	4	0.2
Nutricionists/Dietitians	1	0.0	1	0.0
Nurses (including Nurse/Midwife)	393	16.5	451	18.6
Public Health Nurses	35	1.5	35	1.4
Psychiatric Nurses	113	4.7	107	4.4
Midwives	43	1.8	46	1.9
Nursing Assistants - trained	238	10.0	247	10.2
Nursing Assistants - untrained	156	6.5	134	5.5
Radiographers	14	0.6	13	0.5
X-ray Technicians	9	0.4	10	0.4
Laboratory Technicians	28	1.2	28	1.2
Dispensers	73	3.1	73	3.0
Physiotherapists	4	0.2	4	0.2
Occupational Therapists	-	-	2	0.1
Dental Hygienists	-	-	2	0.08
Dental Auxiliaries	-	-	4	0.16
Public Health Inspectors	84	3.5	84	3.45
Statistical and Medical Records Personnel - trained	9	0.4	8	0.32
Statistical and Medical Records Personnel - untrained	14	0.6	17	0.7

BELIZE

Belize, situated in Central America, is bounded on the north by Mexico, on the west and south by Guatemala, and on the east by the Caribbean Sea. It has an area of 8,866 square miles (22,963 square kilometers) and an estimated population (1974) of 135,277, giving it a low population density of 15 persons per square mile or six persons per square kilometer. About 42,000 people live in Belize City, the major city, the population living in towns, including Belmopan, the new capital, number about 32,000. This means that 56% of the population live in urban or semi-urban areas, while 44% live in rural areas which include tiny islets (cays) in the coastal waters. Belize enjoys full internal self-government, with the United Kingdom having responsibility for defense and external affairs

Women of childbearing age and children under age 15 together make up about 62% of the population The literacy rate is 90%. Life expectancy at birth is 68 4 years (1970). The crude death rate is 5.3 per 1,000 population and the infant mortality rate is 38 3 per 1,000 live births.

Agriculture forms the basis of the economy Sugar makes the greatest contribution, bananas and citrus are grown for export as well as local markets, corn and rice are other important crops, lobster tails and shrimp are exported in fair numbers There are a few light industries, for example, garment manufacturing and a brewery The Government continues its program to increase agriculture production and thereby reduce reliance on imports, while at the same time increasing foreign exchange earnings

The total health expenditure by the Ministry of Health in 1974 was BLZ$2,209,285 (US$1,227,380), which is 8% of the national budget and represents a per capita expenditure of BLZ$16 39 (US$9.10) on health.

Infectious and parasitic diseases, together with influenza and pneumonia, accounted for 18.8% of all deaths in 1973, the majority in children under five years of age The country remains free of the Aedes aegypti mosquito. A national malaria eradication program is in operation, the disease is well-controlled but the country is vulnerable to a resurgence of cases due to immigrant workers from the other countries of the Region where the disease is rampant The exact prevalence of tuberculosis is not known, however, a tuberculosis control program has been formulated and a survey of one part of the country is being planned. A venereal disease control program is in operation. Enteritis ranked first in causes of death in children under five years of age, and second in causes of death for all ages.

Special attention is being given by the Government to increasing the coverage and improving the quality of services for mothers and children who, as pointed out above, comprise a large percentage of the population In this connection, the Government, with assistance from PAHO/WHO and UNICEF, will implement a program which has been drawn up for maternal and child health care

Further work is being carried out in analyzing the data available for diagnosing the nutritional status of the population. Nutrition activities are included in the maternal and child health program, and nutrition education for the whole community is under way

Dental disease is a problem. A free dental service is provided for schoolchildren and indigents, but at present the work performed is mostly limited to extractions due to the shortage of dentists There are plans to train dental assistants Plans are also being made to expand ophthalmology services through the setting up of a free clinic

There are no mental health programs, a patient is given medical care, either ambulatory or hospitalized, but this is the sole activity carried out.

Diseases of the cardiovascular system and hypertension were the leading causes of death in 1974. Neoplasms ranked seventh.

Improvement of the environment has been given high priority by the Government A long-term project for a sewerage system and improved water supplies for Belize City was started in 1975 The project also includes solid waste disposal and fire protection, as well as institutional development of the Water and Sewerage Authority PAHO/WHO is acting as executing agency for CIDA, through whose funds, both grant and loan, the project is mainly being financed The Government, together with CARE and the Peace Corps, has been giving attention to improving rural water supplies (both quality and quantity) in certain areas. It is hoped that this will soon be expanded to all the rural areas of the country, with financial assistance from CIDA

Of the total population, 36.5% have piped water in their houses (56.4% of urban and 13.2% of rural populations), these figures are far below the present goal for the Americas of 80% and 50%, respectively, 17.7% have easy access to piped water ("easy access" being defined as within 1/4 mile from a standpipe).

A disaster plan is reviewed every year at the beginning of the hurricane season by the Central Emergency Organization The Health Department plays an important role in this, being responsible for provision of emergency hospital facilities, maintenance of sanitary conditions, etc.

In the field of veterinary public health, plans have been made for extension of the veterinary laboratories to provide greater diagnostic facilities. Belize is participating in a UNDP-assisted regional project for the training of veterinary assistants After three years free of rabies, there was a small localized outbreak of rabies early in 1975 when three cases were confirmed.

Nursing services, under the responsibility of a principal nursing officer, are provided at hospitals and health centers. Nurses also make home visits. Nursing aides are used In some rural areas, "nannies" are still used in midwifery; in these areas, nannies are given some basic training. The first batch of nurse-anesthetists has been trained locally and will soon go into service.

There is one central laboratory in Belize City which carries out work for all the hospitals, as well as any public health work needed Arrangements are now being made, however, for making use of the small laboratories attached to the district hospitals, and personnel have already been trained. There are three veterinary diagnostic laboratories.

Epidemiological surveillance has been strengthened, efforts are being made to improve the reporting of notifiable diseases, and the epidemiologist in charge has had two short courses of training

In the field of health education, there is a weekly radio program, pamphlets and posters are prepared for display in health establishments, and education is provided by public health nurses and public health inspectors in the course of their work. However, much more needs to be done in this field on an organized basis.

The health system is based on a chain of hospitals strategically situated throughout the country and publicly owned. Inpatient medical care is provided at a modest charge or free, depending on the financial status of the patient. Outpatient treatment is free The hospital facilities are underutilized, but it is planned to correct this by strengthening hospitals through the provision of laboratory and X-ray services and providing increased staff to meet the anticipated increased activities Training of laboratory and X-ray assistants has already been completed, as well as training of nurse-anesthetists. A new hospital is being constructed in the Orange Walk district

In addition to hospitals, there are health centers in urban and rural areas. Services provided, mainly through the nursing corps, include first aid and the care of the mother and child. Three new health centers are planned In addition to health centers, there are fully equipped mobile facilities. These are in accordance with the Government's policy of bringing health services within the reach of all the population.

input of courses in nutrition, health education, psychiatry and chronic diseases; and, in addition, special training is being given to selected nurses in areas such as nursing administration and education, care of the neonate, intensive care and primary care.

e epidemiological surveillance system remains embryonic. The threat of the resurgence of vector-borne diseases, poor vironmental conditions, inadequate food hygiene and, until recently, poor coverage of immunization programs, all combine make the establishment of an active epidemiological surveillance unit supported by adequate laboratory facilities imperative if epidemics are to be prevented. It is realized that the present situation is unsatisfactory, but while existing staff shortages do not permit the epidemiologist to devote his full time to surveillance activity, the situation will be rectified when a medical officer, now on a training fellowship, returns to duty early in 1976

Inadequate attention is still being given to planning. Especially when financial and manpower resources are scarce, and there is emphasis on expanding the industrial and economic sectors, the need for planning and evaluating current programs in the health sector, for modifying or abandoning unproductive ones, and for introducing innovative programs is paramount. Current program emphasis is directed toward staffing and strengthening the Planning Unit within the Ministry of Health, establishing better liaison between the Ministry's Planning Unit and the National Planning Unit, coordinating external cooperation in the health field and within the Ministry itself, and toward staffing and strengthening the Statistical Unit, the Nutrition Unit, the Veterinary Public Health Unit, and the Epidemiological Surveillance Unit. However, a new multidisciplinary planning approach is now receiving attention, and this will involve setting up a model multidisciplinary project for a well-defined geographical area.

The present system of delivery of health care still results in overcrowded hospitals while many rural inhabitants receive very inadequate services The vast size of the country and the difficulty of road communication point to the need for a policy decision on health with respect to more effective implementation of regionalization and integration of services, as well as more effective utilization of the facilities provided at health centers The proposed incorporation of health education into the basic education curriculum of schools is also a step in the right direction. Active discussion is proceeding on a better health care delivery system, especially for rural areas, while an agreement is about to be signed with UNICEF which should result in improved standards of clinical, diagnostic laboratory, and dental care, especially for mothers and children, in hospitals and at health centers.

Basic to the implementation of the country's health programs is the existence of skilled manpower. Latest available figures indicate that there are about 160 physicians, 20 dentists, 629 nurses, 7 veterinarians, 1 nutritionist, 1 occupational therapist, and 173 nursing assistants Thus, there is a severe shortage of skilled personnal. A fellowship program is designed to offset this deficiency, while assistance is being given in the development of local training programs, such as for community nutrition workers and dental nurse auxiliaries The recently formed Staff Development Committee is already playing an invaluable role in reviewing and coordinating the training program in accordance with local needs.

GUYANA

Situated on the northeastern coast of South America, 1°- 8.5° north of the equator, Guyana has a land mass of 83,000 square miles (210,000 square kilometers). With its 1971 population of 736,000, it has a population density of about nine persons per square mile (three persons per square kilometer). Most of the population (94%) reside in the coastal area, which is below sea level, the rest of the population lives in the heavily forested hinterland. It is estimated that about 219,000 people live in localities with less than 2,000 inhabitants. Apart from the capital city, Georgetown (population 200,000), there are two towns, New Amsterdam with a population of about 25,000, and Linden, population 35,000, a new and growing township.

The country is basically agricultural, the main exports being sugar and rice, but there is a major thrust toward industrialization, and the bauxite industry is an important revenue earner and source of employment. As a result of its outstanding performance, there is growing confidence in the country's fiscal and economic policy For example, the year 1974 opened with the nation's gross international reserves at $28 million, these reserves stood at over $120 million in December 1974, and the latest figure quoted (July 1975) was $260 million. The GNP at factor cost in 1973 and 1974 was G$547.6 million and G$810 million, respectively.

The Ministry of Health is under the political direction of the Minister of Health, who is responsible for all matters affecting the nation's health, the administrative head is the Permanent Secretary, who is advised on professional matters by the Chief Medical Officer.

In the 1975 budget estimates, the Ministry of Health was allocated G$24 million, out of a current expenditure of G$303 million, out of a capital expenditure of G$227 million, the Ministry was allocated G$4.7 million. The high-priority sectors--agriculture, manufacturing, power, transport and communications--shared about 60% of capital expenditure

Health conditions ir Guyana are determined by a complexity of factors, which include (1) population distribution 93% of the population inhabits less than 10% of the territory, about 219,000 people live in communities of less than 2,000, (2) population structure 44% of the population is under 15 years, 62% under 25 years, leaving a high dependency ratio, (3) local geography the low-lying coastal area presents a somewhat intractable drainage problem, contributing to mosquito breeding and vector-borne diseases, while in the interior the problem of vector-borne diseases is linked with the movement of people across the borders, (4) inadequate attention to nutrition requirements of vulnerable groups, (5) poor response to voluntary immunization programs, (6) inadequate water supply, sewerage and waste disposal systems, (7) insufficient community awareness and community participation in health programs, and an inadequate infrastructure characterized by lack of implementation of planned programs, resulting in poor utilization of existing resources and insufficient coverage of rural areas; (8) poor information systems, (9) a chronic shortage of skilled staff, and (10) physical plants in need of maintenance or replacement

As stated, vector-borne diseases still command a high priority in the Government's programs The threat of resurgence of malaria, a consequence of the high cost and unavailability of insecticides and drugs, has meant that maximum efficiency must be obtained from the efforts being directed at and concentrated on the country's borders. Coordination of efforts with neighboring countries is also an important element in the control program, and there is need to verify the susceptibility of the vector to the insecticides available These are the considerations which dictate the orientation of the country's malaria eradication program The *Aedes aegypti* eradication program has been similarly affected by escalating costs and unavailability of insecticides While attention is being given to the problem of supplies and logistics, the question of managerial performance is not being neglected, so that it is hoped to achieve eradication in designated Area I by the end of 1975 as well as the other program goals outlined in the current Plan of Operations

Communicable and parasitic diseases still contribute to unnecessary morbidity, especially among children. Latest information available (1974) for communicable diseases reveals the following number of cases. diphtheria 15, gastroenteritis 1,026, influenza 181, measles 314, tuberculosis 188, typhoid 123, and malaria 72

With the introduction in 1975 of legislation requiring children to be immunized against poliomyelitis, diphtheria and tetanus before entry to schools, it is confidently anticipated that the incidence of these communicable diseases will decrease. The immunization program also includes BCG and, for the pregnant woman, tetanus toxoid

The 1971 Nutrition Survey identified the major nutrition problems as malnutrition and anemia, especially in women and children, with 18.2% of children under five years of age having grades II or III malnutrition according to the Gomez classification. The incidence of diabetes mellitus is not accurately known. In few areas of the health field is the shortage of qualified staff as acute as in the field of nutrition. Nevertheless, steps are being taken to overcome a difficult situation: a malnutrition clinic has been set up at the country's largest hospital, the quality of antenatal care has been improved by the introduction of high risk clinics, and the staff of the Nutrition Unit is being increased by the training of food service supervisors within the Project for the Education and Training of Allied Health Personnel, as well as in a local course to be developed later this year for the training of community nutrition workers It is hoped, too, that Cabinet approval of the food and nutrition policy will be obtained shortly.

The infant mortality rate (33.6 per 1,000 live births in 1971), although falling, is still far too high, the maternal mortality rate at 0 6 per 1,000 live births should not lull one into complacency Strenuous efforts are being made to improve the quality of care at antenatal clinics and during delivery, and to initiate postpartum clinics. The health of the infant is being safeguarded by measures such as educating mothers on infant feeding and encouraging breast-feeding, by encouraging attendance at child welfare clinics, and by organizing immunization programs A new agreement is about to be concluded with UNICEF which, by equipping health centers and laboratories and by training personnel, will also help to improve the standard of care.

Not much scientific data are available on the dental status of the population, but such studies as have been done suggest that dental caries is a significant problem. There is a severe shortage of qualified dental personnel--there were 20 dentists in 1971--and Government services are geared to provide little more than extraction. These are the circumstances that led to a policy decision to institute the topical application of fluoride in children and to establish at the earliest possible date a dental training school to cater to the needs of children aged 2-12 years. It is hoped that the dental auxiliary training school will soon be a reality. PAHO/WHO has already provided advisory services and a fellowship for this project and is providing some educational material.

With regard to environmental sanitation, as a result of the rapid growth of the city only 30% of central Georgetown is sewered, 94% of the urban population has a house-connected water supply while 74% of the rural population has access to water supplies.

A UNDP-funded project for technical and economic feasibility studies on a water supply for Georgetown, and on a sewerage system and storm drainage for Georgetown, New Amsterdam and Linden, is now in its final phase. Implementation of the recommendations is a prerequisite to improvement of this aspect of environmental sanitation. PAHO/WHO is also advising on a suitable method for solid waste disposal in the city of Georgetown.

The Veterinary Public Health Unit established in 1972 to promote coordinated action and better liaison between the Ministries of Health and Agriculture is still functioning suboptimally. Plans are afoot to improve its staffing and to submit for approval appropriate legislation to enable it to adequately perform its function of meat, milk and food inspection and to assist in the diagnosis of the zoonoses. UNDP approval is currently being sought to establish a veterinary diagnostic laboratory.

The system of nursing is under review to cater to the increasing demands being made on this category of staff. There is an ongoing evaluation of nursing activity vis-a-vis nurse training, with a view to improving nurse training in relation to local needs as well as to effect a redistribution of duties to ensure optimal utilization of nurses' time. Several approaches are being made simultaneously to achieve this objective the Principal Nursing Officer is being provided with a fellowship to enable her to play a more dynamic role in the planning, implementation and evaluation of the health care delivery system, especially as it affects the nurse; there is a review of the basic curriculum to allow a more meaningful

GRENADA

Grenada, including Carriacou and Petit Martinique, covers an area of 343.66 square kilometers with a population of 97,000 (1973), giving a density of 281 persons per square kilometer. About one-third reside in the parish of St. George, which includes the capital; otherwise the population is evenly distributed throughout the islands. In 1970 the population under 15 years of age represented 46 64%, and 46 5% was in the age-group 15 to 64 years. Women between the ages of 15-44 years constituted 22.6%. The population increase over the decade 1960 to 1970 has been 0 6% per annum. It is estimated that 17,500 people--mostly young--emigrated during 1960-1970 There has been a steady decline in fertility and birth rates during this period The rate of natural increase is now estimated at slightly under 2% per annum In 1972 the crude birth rate was 27.42 per 1,000 population, the crude death rate 6.9 per 1,000 population, and the infant mortality rate 16.0 per 1,000 live births.

Primary school enrollment was 99% in 1970. Gross domestic product per capita increased from US$186 in 1964 to US$300 in 1972. The labor force is estimated at 23,100, of which more than 20% is unemployed Along with the expanded production of the export-oriented crops, cocoa, bananas and nutmeg, the Government encourages diversified agricultural production for domestic consumption and for the regional market vegetables, fruits, dairy products and livestock An Industrial Development Corporation has been established to stimulate development of small-scale industry Growing interdependence among agriculture, industry and tourism will create job opportunities to meet the demand of a young and rapidly growing population.

Grenada became a fully independent state on 7 February 1974 Application for PAHO membership is under consideration. The Policy Advisory Committee, with the Minister of Health as Chairman, ordains the health policy of the country and defines priorities Although there is no formal development plan, the Government has tried to achieve fairly equitable distribution of income to provide adequate educational, health and social facilities

The Government recurrent budget spent on health amounted to 15% in 1970, while 18 1% was spent on education, 8.6% on the economic sector, and only 0.1% on housing. Capital expenditure on health was 2 1%, on education 20.2%, and on the economic sector 45.1%. There have been increases in the percentage provision for health over the past five years.

Besides PAHO/WHO, external aid is provided by UNDP in education, vocational skills, finance, management, water supplies, hospital administration, hospital maintenance, statistics, medical laboratory, sewerage, and veterinary medicine, by CIDA in water supply and the fishing industry, by the Medical Research Council of the United Kingdom in agriculture and laboratory; and by Project HOPE in hospital, laboratory and inservice training of public health inspectors. Agriculture will have a large technical input from UNDP over the next few years, aiming at self-sufficiency and economic improvement.

Medical services are available at the St. George's General Hospital, two district hospitals, and 36 medical stations, including four health centers which are easily accessible to the rural population Improvement of administrative management is being promoted through "Continuing Education in Management" in the parishes of St John and St. Mark. The progress of health services has been slow since 1974, due to shortage of personnel, transport, and supplies, including drugs, vaccine and insecticides A senior officer from the Ministry of Health has just completed training in hospital administration in the United States of America No food supplements, except for those from the OXFAM food supplementation program, have been available over two years, and the number of children under three years of age attending child welfare clinics has been greatly reduced A food and nutrition survey was carried out in 1972 at the village of La Poterie, and a survey of intestinal parasites, nutrition and anemia is under way A system of follow-up of malnutrition cases after discharge from hospital has been developed Development of a national food and nutrition policy is under consideration.

The low level of attendance at child welfare clinics has contributed to the low level of immunization in the population at risk. A more intensive immunization program against the common communicable diseases is planned as part of the maternal and child health program, which is being reformulated. Reformulation of the maternal and child health programs, with inservice education of staff, is being planned, particularly in developing postnatal clinics Mortality in children under five years comprised 18% of total deaths Forty-five per cent of deaths in children under one year were due to Group B diseases (diseases peculiar to early infancy) Group A diseases (infectious diseases) were responsible for 29.9% of deaths in children under one year of age

A new system of notification of reportable diseases has been introduced, including reporting by nurses A system of medical records abstraction and collation has been established at the main hospital. A small statistical unit is established at the Ministry and is working in close association with the Caribbean Epidemiology Center. Special efforts to upgrade diagnostic and treatment facilities and to develop an adequate system of records for hospitals are being made A medical pathologist has been appointed Extension of the Rabies Section at the Park Veterinary Diagnostic Laboratory will allow diagnosis of some zoonotic diseases.

An Aedes aegypti eradication program completed its eighth verification cycle The total eradication of Aedes aegypti, planned for the end of 1973, was not realized, the program was slowed down due to shortage of insecticides. Incidence of indigenous malaria remains at zero A rabies eradication program aimed at breaking transmission in the main host, the mongoose, had considerable success by the end of 1973 However, the incidence of animal rabies has increased since early 1974 when the rabies control program was suspended

In 1972, 25 new cases of Hansen's disease were notified. The incidence of tuberculosis has declined dramatically in recent years. The incidence of venereal diseases, particularly gonorrhea, continues to rise, with 1,900 cases diagnosed in 1972

A proposal has been made to Project HOPE for assistance in training of dental assistants. In the absence of trained staff, development of a community psychiatric program is slow. A health education program has been developed for improving community participation in the health sector

In 1972, 44% of the urban and 20% of the rural populations were served by house-connected water supply. Houses having easy access to water supply comprised 56% in urban areas and 80% in rural areas (1972) Twenty-nine per cent of the urban population are connected to sewerage systems, 95% of the total population have sewerage systems or latrines. Water development and sewage disposal programs are currently receiving much attention in certain parts of the island. Solid waste disposal is poorly developed, but receives some attention in view of its effect on the Aedes aegypti eradication program. An engineering and financial feasibility study of a sewerage project for the Grand Anse/Horne Rouge area in South St George's commenced in August 1973 and was completed in early 1975. Request for funding of the project is under consideration. Improvement of food hygiene and the processing of food substances is in need of attention.

At present the number of health personnel (with rate per 10,000 population) are 31 registered medical practitioners (3.4); 4 dentists (0 4); 1 full-time pathologist (0.1), 1 veterinarian (0.1), 8 public health nurses (0.9), 32 clinic nurses (3.5); 10 public health inspectors (1 1), and 20 registered dispensers (2.2). Development of human resources, with a more equitable distribution of trained staff, is a serious problem in Grenada. Allied health personnel are in short supply and training facilities are almost nonexistent.

A program for improvement and maintenance of medical care facilities is being conducted at the St. George's Hospital, as a model project for the less-developed countries in the Caribbean. The maintenance organization, formed in late 1973, consists of eight artisans under one supervisor. A van was provided for a mobile repair unit for outlying posts. In 1974, some workshop facilities were installed. Full organization of this project is under consideration.

The Government recog[illegible] organization of general services to support the technical activities for the improvement of health, [illegible] being made to correct the situation Organizational structure and hospital administrative practices are some of the areas receiving attention There is no full-time planning unit in the Ministry of Health, but there is a health Planning Committee whose members include a representative from the Economic Planning Unit

There is a shortage of trained personnel in many fields, for example, dentistry and sanitary engineering In other fields the distribution is very uneven, with a preponderance in urban and a scarcity in rural areas The overall ratio of doctors per 10,000 population for the whole country is 3 2, but in the urban areas (over 20,000 population) it is 6 4 while in the rural areas (under 2,000 population) it is only 0 5 Similarly with nursing, the overall ratio per 10,000 population for the whole country is 6.5, while in rural areas it is only 2 4 and in urban areas it is 11.8

The need for the development of skilled manpower has been recognized, and this is a high priority of the Government. The Nursing School is being upgraded, there is a continuing program of inservice training for nurses and for public health inspectors, and local seminars for nurses, doctors and other categories of personnel take place from time to time Plans include continued training abroad of all categories of personnel, as necessary, in basic courses, continued postbasic training in specific fields, and training of auxiliary workers in dentistry and veterinary public health. Belize is participating in the UNDP-assisted regional project on education and training of allied health personnel

Maintenance of buildings, equipment and vehicles badly needs improving. A review of the present situation has been made and recommendations for a program of maintenance put forward.

JAMAICA

The population of Jamaica at the end of 1974 was estimated as 2,019,700, with 43.5% under 15 years of age (1970 census). The national birth rate was 30.6 per 1,000 population, lower than that registered the previous year; the Government's target, as a result of a dynamic population policy, is a rate of 25 per 1,000 by 1977-1978. The crude death rate is 7.2 per 1,000 population, and the infant mortality rate 26.2 per 1,000 live births. The fertility rate remained constant between 1973-1974 at 182 births per 1,000 women in the 15-44-year age group. The Government's health budget for 1975-1976 is J$70,052,299, which represents 7.7% of the national budget.

The principal causes of death in Kingston and St. Andrew in 1974 were accidents and violence (12.4% of all deaths); cerebrovascular diseases (12 2%); heart diseases (11.5%), neoplasms (11.0%), gastroenteritis and other diarrheal disorders (5 8%), pneumonia (5 5%), diabetes (4.4%), diseases of early infancy (3.5%), avitaminosis and malnutrition (1.3%), and tuberculosis (1 0%) The above-mentioned causes represent 68.9% of all deaths.

The Government is participating in the Caribbean Epidemiological Surveillance Program, has appointed an epidemiologist, and reviewed the system for reporting communicable diseases. Action is being taken to raise the level of immunity of the population to smallpox, polio, diphtheria, whooping cough, tetanus, typhoid fever and tuberculosis. Maternal and child health and family welfare are being greatly strengthened by the integration of the field staff of the National Family Planning Board into the Maternal and Child Health Service of the Health Ministry New norms and procedures are being developed and studies are being conducted to strengthen the management of the program. During 1974 services were offered through 299 antenatal clinics, 334 child health clinics, and nine new maternity centers The PAHO/WHO Report on Leprosy, which proposes the phased closure of the Hansen Home and the development of community facilities for domiciliary treatment, is being implemented. A community education program is in progress, and inservice training courses for doctors, nurses and sanitary inspectors were held in all the parishes. A National Food and Nutrition Policy has been developed and is to be implemented with the assistance of CFNI.

The National Aedes aegypti Eradication Program entered the attack phase in June 1975 in Region No. I (Kingston and St. Andrew) and in August 1975 in Region No II (St. Catherine, St Thomas and Portland) The rest of the country (Regions Nos III and IV) is in the preparatory phase, including geographical reconnaissance and mapping Up to the end of June 1975, 253,294 houses out of a total of 429,458 were mapped (58.98%) One hundred per cent of the training activities have been accomplished To eradicate the Aedes aegypti mosquito, J$5 3 million has been made available. Malaria surveillance continues, and during 1975 two imported cases were notified and treated

All inpatients of the Bellevue Hospital have been surveyed as a basis for their rehabilitation World Food Program resources are being used to develop rehabilitation facilities, and the Government is extending the coverage of community psychiatric services Psychiatric beds have been provided at the New Cornwall Regional General Hospital.

Dental services for schoolchildren are expanding as graduates from the Dental Nursing School (20 per year) are absorbed into the health services.

The Government is committed to improve rural water supplies, and funds for this purpose are available in the 1975-1976 budget Financial assistance is also being sought to that end, and a loan of US$7 7 million is being negotiated with the IDB. A program of institutional development is being implemented at the National Water Authority, which is responsible for the rural water supply program, to make that agency more efficient in the delivery of its service, for the realization of the Government's goal of providing every citizen of Jamaica with access to potable water supply The World Bank approved in June 1975 a loan of US$15 million to help finance a water and sewerage project for Greater Kingston The total cost of the scheme is J$30 million, and its objective is to provide an additional 10 million gallons of water daily to the Kingston metropolitan area by 1980

A new Department of Environmental Control is being organized within the Ministry of Health and Environmental Control, which will in the future have the responsibility of conducting and coordinating all the efforts of the Government in this critical area The preliminary activities, designing the structure and scope of the new department, were accomplished during 1975. New programs in water and air pollution control and in occupational health are aimed at developing the country's ability to assess and monitor the environment and take corrective action when necessary.

As part of a joint program with the Ministry of Health and Environmental Control, the Ministry of Agriculture is strengthening the diagnostic capacity for zoonotic diseases, especially brucellosis and bovine tuberculosis, and it is proposed to improve meat and hygiene inspection A Veterinary Public Health Unit was created during 1975 within the Ministry of Public Health and Environmental Control

Jamaica will be the location for the new Drug Testing Laboratory, which will serve both Jamaica and the Caribbean region.

The field staff of the Bureau of Health Education is being strengthened by the transfer of 44 educators from the National Family Planning Board A training program is being developed to enable this staff to function in a wider capacity.

The reorganization of the health service continues, with emphasis on the decentralization of control of the 21 general hospitals and six special hospitals through delegation of authority to the regional hospital boards A new regional hospital of 400 beds was opened in 1974 and has greatly strengthened specialist care for the population of western Jamaica. It complements the six special hospitals situated in the Kingston area Two hundred extra beds at the Kingston Public General Hospital and 148 beds at the Victoria Jubilee Maternity Hospital will soon be available Ten rural maternity centers with four beds each have been constructed and nine of them entered into operation in 1974.

The Ministry of Health has recently prepared a paper, "Health for the Nation," in which it sets out proposed health policy and in particular focuses on the Medicare (family doctor) services which aim to bring adequate care to all through an insurance scheme.

Mental health, maternal and child health, family planning and nutrition, environmental control, and development of health manpower are priority areas for the Government of Jamaica.

The lack of health personnel is a major constraint to the development of adequate health services in the country. There is an uneven distribution of doctors between urban and rural areas, with ratios as low as 0.6 per 10,000 population, compared with the national average of 2.6 per 10,000. The Government is concerned both with improving these ratios and with improving the effective utilization of doctors and other personnel. It is providing a comprehensive postgraduate program for physicians to counteract the "brain-drain" of those who formerly sought such training abroad. It is proposed to provide extended specialist training for suitable nurses so that they can function as nurse practitioners, nurse anesthetists have already been trained. The fullest potential utilization of trained auxiliaries is being explored and a national training program with a target of 7,000 community aides is in progress. Up to mid-1975, 600 community aides had been trained.

The shortage of dental officers, especially for the school dental services, led to the establishment of a Dental Auxiliary Training School, with an annual output of 20 dental nurses. A School of Physiotherapy was established in 1972, producing its first 16 graduates in 1975. The well-established West Indies School of Public Health continues to prepare public health doctors, nurses, and inspectors for Jamaica and the English-speaking Caribbean.

At the College of Arts, Science and Technology, courses are now being offered in pharmacy and medical technology. In August 1975 the training course for intermediate-level personnel in health records and statistics, with 18 students, was completed. A new course for 20 students started in September, and it is expected that more advanced second-year training will be available for those in senior positions in the health statistics system from 1976. Ten radiographers are trained annually for the Caribbean area at the University Hospital.

Ten animal health assistants with six months of inservice training, plus 12 with three months of retraining, were made available in 1974-1975 The Government supports the regional course in Guyana, but will continue to provide local courses in the interim.

A comprehensive program for the training of environmental health personnel for ministries and agencies is envisaged; meanile, short courses have been conducted at the West Indies School of Public Health and at the College of Arts, Science and hnology Courses in the fundamental principles of maintenance and water supply systems and occupational health were ıducted in 1975.

A Health Facilities Maintenance Division has been formed to coordinate the activities of the Ministries of Health and Works Zone offices have been established in Montego Bay and Kingston. The system of management has been developed and norms and procedures are being formulated for preventive maintenance at the new Cornwall Regional Hospital, and will be introduced into other hospitals. New procedures for maintenance have been implemented, and inventory systems are being introduced. Supervisors are being trained.

Early attention is being given to the enactment of modern mental health legislation.

TRINIDAD AND TOBAGO

Trinidad and Tobago cover an area of 5,128 square kilometers and support a population of approximately 1.06 million (1973) Population density is high, 207 per square kilometer. Some 35% of the population live in St. George County, a large urbanized area in the northwest of Trinidad which includes the capital, Port of Spain. The rate of natural increase of the population declined from 3.12% in 1960 to 1.77% in 1973, after a temporary increase to 2.01% in 1972 Emigration further reduced the actual population growth from 3.1 to 0 1 and 1.3% for the corresponding years. Fertility rates decreased from 192 4 per 1,000 women 15-44 years of age in 1960 to 109 7 in 1973 There has been a vigorous national family planning program in the country since 1968 The birth rate, which was 39.5 in 1960, fell to 24 5 in 1970, and was 24.7 in 1973. In 1972, 40.3% of the population were under 15 years of age, 41.6% of women were between the ages of 15 and 44 years The labor force was estimated at 389,000 in 1973, of which 17% was unemployed

The Third Five-Year Plan (1969-1973) outlined a development strategy which would achieve full employment for the country in 15 years, a diversified and greatly strengthened economy, and a greater degree of economic independance. The role of trained manpower was identified as even more important than financing in such a long-term strategy. Education and training therefore became a central feature of the development strategy for the 1970's. Training in many aspects of management in both private and public sectors, was regarded as an essential feature of this overall strategy. Per capita income was US$983 in 1972

Life expectancy was computed at 64 1 years for men and 68 1 for women (1970). The crude death rate fell from 7 9 per 1,000 population in 1960 to 6.6 in 1972, and was 7 1 in 1973. The infant mortality rate, which was 45 4 per 1,000 live births in 1960, fell to 32 4 in 1973 The maternal mortality rate, which was 1.9 per 1,000 live births in 1969, fell to 1.4 in 1973. In 1973, deaths in children under five years of age represented 14 02% of all deaths In 1971 the first five principal causes of death (with ratio per 100,000 population) were diseases of the heart (172.9), cerebrovascular disease (84.8), malignant neoplasms (62.8), influenza and pneumonia (39.4), accidents (38 0), and diabetes mellitus (37.8).

In 1974, Government expenditure on health amounted to TT$58,898,705 (US$29 million)--approximately US$27 per person. Approximately 12% of the total national budget is allocated for health services expenditure every year It is estimated that a further TT$10 million is spent on health by the private sector

The National Health Plan (1967-1976) provided for the development of health services on a regional basis Two regional hospitals with a total of 1,518 beds provide increasingly specialized services for the peoples of the country, who are subserved by a network of county and district hospitals and maternity units Emphasis is being placed on upgrading hospital services at all levels, with special attention given to improvement of the level of health care at county and district hospitals In some instances, specialist posts are being increased at the county hospital level, but the system also includes extension of coverage by visiting specialists from regional centers Coverage and provision of minimal services for the few remote areas in Trinidad will be provided through the use specially trained allied health professionals, with a system of easy reference to the county or regional level where indicated District health services have been and will continue to be developed according to the Health Plan, on the basis of integrated medical care services Although attention is being given to integration in all counties, three areas are now receiving special consideration. In addition, a county community health pilot project is being carried out to improve health care in the county and to provide guidelines for overall development with respect to county administration, integration of care, and improvement of hospital, clinic and field services One hundred and one strategically placed health centers provide basic outpatient services in the nine program areas into which the county is subdivided More ambulance service is needed to transport patients from the periphery to the more specialized central units Telephone communication is available in most health services

Maternal and child health services are being developed as an integrated program with family planning, and will include specific services for teenagers Apart from providing prenatal and postnatal services for all mothers and attempting to reduce the 14% of deliveries by unqualified persons, the Government has set a target of reducing the birth rate to 19 per 1,000 by 1977 A reconstituted Population Council has recently been appointed, which will ensure greater representation of the public sector An infant and childhood mortality study began in 1974 and is being continued in the County of Caroni

Results from the 1970 household food consumption survey suggest that 31% of the population are not receiving sufficient protein and that 39% are receiving insufficient calories. Average daily per capita consumption was 2,948 calories and 82.5 grams of protein, including 36.4 grams of animal origin A course for food service supervisors was carried out during 1974 A pilot project on the outpatient management of moderately severe and severe protein malnutrition started in January 1975 The National Nutrition Council is working towards the development of a national food and nutrition policy, and the Nutrition Committee of the Ministry of Health is planning to improve the community nutrition program and provide better nutrition and dietetic services in hospitals.

Family life education and health education are regarded by the Government as important projects for developing community participation, and awareness in communities of their needs in terms of health services development

Compulsory immunization for poliomyelitis and smallpox has been continued and is mandatory before admission to primary school. The Government has recently introduced similar regulations for vaccination against diphtheria and tetanus Control of food handlers through annual compulsory medical examination and registration, with improved surveillance of typhoid cases and carriers, has been continued

In the insect vector control program, malaria vigilance is maintained. The reinfestation with Aedes aegypti has caused considerable concern, and its control continues at a cost of nearly US$500,000 a year, which is going to be increased.

The Government has recently introduced a very extensive program against venereal diseases. Tuberculosis control is maintained on ambulatory lines BCG is offered to all primary school entrants and revaccination will be provided for those leaving school. Institutionalized treatment of leprosy is actively discouraged. Venereal disease control and treatment are being strengthened through improved health education, contact tracing and early treatment A screening program for cancer of the cervix uteri has been continued. The mental health program carries out community-based ambulatory care with extension of facilities at the local level. Diabetes, hypertension and accident prevention have been given increasing priority.

With expansion of facilities at the national public health laboratory, and establishment of the Epidemiological Unit and the Caribbean Epidemiology Center, epidemiological surveillance has been greatly strengthened Reporting of specific infectious diseases by telephone to the Epidemiological Unit by sentinel physicians has been instituted as a pilot for the Caribbean.

A Veterinary Public Health Unit was established in the Ministry of Health in 1973 One of the principal aims is the development of an effective food protection program. The Unit, in collaboration with the Animal Health Division of the Ministry of Agriculture, is embarking on control programs of several zoonotic diseases, utilizing the recently trained animal health and veterinary public health assistants The development of a veterinary diagnostic laboratory has provided the tool for surveys of zoonoses in animals to ascertain the incidence of these diseases, which are considered a health hazard in many parts of the Americas.

There is a considerable deficit between demand and actual supply of water. In spite of this fact, in 1973, 83% of the urban population was served by house connection and 99% had either house connection or easy access to a piped water supply. In rural areas, only 38% was served by house connection and 95% had house connection or easy access. In 1973, 51% of the urban population and 0 3% of the rural population were served by sanitary systems Sanitary disposal of solid waste in municipalities is poorly developed, and is nonexistent or grossly deficient in many rural and periurban areas. The National Water and Sewerage Authority, through its annual targets, hopes to provide 100% of the urban populations with

water connections and to achieve a 50% improvement in rural areas within this decade. Plans for improvement of sewage and solid waste disposal are being developed in major towns. The Public Health Engineering Division began to operate in 1972 and its functions are to advise on and engage in the various disciplines of public health engineering, thereby contributing to the upgrading of rural health, establishment of standards, and control practices. Because of the serious lack of staff, the major activities are the privy construction and supply programs in rural areas. Other activities, to a great extent, depend on requests from various government and other bodies. The Public Health Engineering Division has now been designated the operating area of the newly formed Pollution Control Council.

Development of medical records systems, initially at regional hospitals and later in the district hospitals and health centers, with processing of information at the Ministry of Health, is under way. The strengthening of the Statistical Unit of the Ministry and the provision of trained personnel at the peripheral level has been undertaken with a view to allowing realistic planning and programming of health care delivery services and disease surveillance.

A national hospital equipment maintenance program is being developed as a priority, needing much input in both human and material resources. A new regional program is being developed for maintenance services. Inadequate administrative management techniques, particularly at the middle level, have contributed to the problems at the ministerial and institutional levels for many years, and the Government is actively attempting to redress the situation. A project geared towards senior administrators and top management personnel has been continued in order to strengthen the administrative management practices in hospitals and district health services. Also, an administrative and financial study in health services is under way, with a loan from IDB.

Ratios of staff to population in 1975, although not the lowest in the Caribbean area, demonstrate an inequitable distribution, with serious shortages of health manpower in some rural areas. The number of personnel (and ratio per 10,000 population) is 544 physicians (5.02), 62 dentists (0.6), 1,737 nurses/midwives (Government sector only) (15.9), 575 auxiliary nurses/midwives (Government sector only) (5.3), 4 public health engineers (0.04), 130 public health inspectors (1.2), 289 pharmacists (mostly in the private sector) (2.7), 6 health educators (0.06), 22 veterinarians (0.2), 15 nutritionists (0.1), 14 social workers (0.1), 2 professional statisticians (0.02), 10 statisticians (0.1), 3 medical record officers (Government sector only) (0.03), 18 intermediate-level statisticians (0.2), 12 statistical/medical record clerks (0.1), 23 X-ray technicians (0.2), 13 opticians (0.1), and 31 optometrists (0.3). The shortage is acute in most areas but is particularly marked in the fields of dentistry and public health. Improved distribution of present staff, with strengthening of supporting and auxiliary services, is being undertaken. Training courses already exist in regional and some country centers for nurse and assistant nurse training and for public health nurse training. National programs for dental nurse training (35 students a year) and animal health assistant and veterinary public health assistant training (28 students a year) have been developed, and the Government looks forward to the establishment of a regional training program for allied health professionals in 1975. Through a loan from the World Bank, the Government is improving its training facilities for public health nurses and nurses/midwives, especially in family planning procedures and education. There is a plan to train nurse practitioners with a loan from IDB. Moreover, the Government is considering the further extension of medical education in the country. Postgraduate medical training is being developed at Port of Spain Hospital in conjunction with medical staff from the UWI, and plans are being considered for the training of home economists/nutritionists at the UWI in St. Augustine. The Training Unit of the Water and Sewerage Authority is being strengthened

WEST INDIES

Leeward Islands (Anguilla, Antigua, British Virgin Islands, Montserrat, and St. Kitts-Nevis)

The Leeward Islands have in common the geographical features of being tropical, small and evergreen, with a dry season from January/February to May/June and a wet or rainy season from July to December. St. Kitts-Nevis, Montserrat and the British Virgin Islands are rather mountainous. The islands also have a common socioeconomic base of agriculture and, subsequently, tourism. The countries have all been severely damaged by the present inflation and energy crisis which have affected both tourism and agriculture.

A characteristic demographic feature of the area as a whole is that 40-45% of the population are under 15 years of age and about 15% are under five years. This large group of dependents, together with the aged and the low economic production of the area, has a serious adverse effect on socioeconomic development. Much has been done recently to stimulate the economic development of Caribbean regional bodies such as the UWI, the Caribbean Development Bank, and the Caribbean Community Secretariat. Other countries such as the United Kingdom, the United States of America and Canada have also actively assisted with development, technical and financial aid.

Although all the countries do not have a formal health plan, there is general agreement that the Governments are committed to provide health services to the entire population, free or at the lowest possible cost. There is also a commitment to improve the quality of the services provided, and emphasis is being placed on an integrated type of health service system.

In the field of communicable diseases, the Governments are committed to immunizations against vaccine-preventable diseases; to eradication of *Aedes aegypti*, although the increased cost of pesticides, equipment and wages are making this very difficult; and to the control of venereal diseases and tuberculosis. The Governments have committed themselves to support regional and local epidemiological surveillance against communicable diseases.

Services to mothers and children are provided at hospitals and health centers throughout the countries. Upgrading of the quality of these services is seen as an important need. St. Kitts conducts a formal maternal and child health and family planning program with the assistance of PAHO/WHO and UNFPA. The other countries are interested but are slow to take policy decisions on it. All, however, agree on the need for the availability of family life education and for family planning services as they relate to maternal and child health.

The Governments are aware of the presence of protein-calorie malnutrition in children and are committed to take steps to improve it. Attempts are being made to strengthen this aspect of maternal and child health programs and to exploit the educational opportunities of such programs.

The Mental Hospital in Antigua serves the area to the limits of its capability, but some mental illness cases have to be sent farther afield for treatment. There is a trend to develop general hospital and outpatient treatment of patients, with good results.

Dental health is a serious problem in the islands, but scarce human and financial resources have confined activities to antenatal clinics, schoolchildren, and indigent patients, and the service is mainly for extractions.

All the Governments have given environmental health high priority. They have entered into agreements with UNDP and PAHO/WHO for programs in environmental sanitation (Montserrat), water supplies (St. Kitts), water administration, plant operations and regulations (Antigua), and a mobile veterinary laboratory and training of animal health assistants.

District and public health nursing services perform excellent work, but there is serious need, both quantitative and qualitative, for refresher training of staff and for the preparation of new staff and nursing auxiliaries.

No major medical laboratories exist in the area. Only intermediate-type clinical laboratories are found in the hospitals. There is no pathologist in the area, and important specimens have to be sent to Jamaica, Barbados or Dominica and some to the Caribbean Epidemiology Center.

The need for development of health education is recognized. At present the only health education available is that routinely carried out by public health inspectors and nurses.

The Governments are concerned about the obvious weakness in health planning but are virtually powerless to improve the situation because of scant human and material resources.

Efforts have been made in the field of management of health services. St. Kitts and Antigua have been collaborating with the other Governments and PAHO/WHO in a course of continuing education in this discipline. Three seminars have been held and the last of the series of four will take place in 1976.

Hospital care is also an area of great weakness. Until recently there was no trained medical or lay hospital administrator. Antigua entered into an agreement with UNDP and PAHO/WHO to provide a hospital administrator, and one national was provided with the opportunity to train.

Medical records are kept and health statistics are compiled, but the flow is irregular and usually not up to date. There is a shortage of trained personnel in the fields of health statistics and medical records.

There is a severe shortage of professional and allied health personnel in all areas of the health sector in these islands. This has been recognized, and the Governments, together with the Caribbean Community Secretariat, have subscribed to a regional UNDP PAHO/WHO project for the training of allied health personnel.

Dominica

The island of Dominica is the largest of the Windward group of islands. It is a fertile, tropical island with excellent prospects for agriculture if well financed and planned. It is an Associated State of the United Kingdom with full internal independence.

Government is by Parliamentary Democracy. The Head of State is the Governor as the Queen's Representative; the leader of government business is the Premier who, like other members of the legislature, is elected by universal adult suffrage. The Premier presides over the Cabinet, comprising Ministers of Government appointed by the Governor on the advice of the Premier.

The economy is based on agriculture, particularly citrus fruits, bananas and coconuts. In recent times food crops and vegetable production have increased.

The health situation in the country and its socioeconomic possibilities may be reflected in the following statistics, which are the latest available and are subject to some inaccuracies because of the very poor information and statistical conditions prevailing in the country.

The total population is estimated at approximately 74,000, with a population density of 256 per square mile, 49% are under 15 years, and 18% under five years. Life expectancy figures are not available but, like other Caribbean islands of similar socioeconomic level, probably lie in the region of 65 years. The birth rate is 36.4 and the general mortality rate 10.1; the natural population increase is 26.3 per 1,000 population. The infant mortality rate is 33.4 per 1,000 live births; neonatal mortality is 16, while the death rate (specific) in the 1-4-year age group is 3.4 per 1,000 population.

Communicable diseases, especially gastrointestinal infections and parasitic infestations, show a high mortality and morbidity rate. The country has 46 hospital beds per 10,000 population.

Pipe-borne water is accessible to 72% of the population--24% by house connections and 56% with easy access; 20% obtain water with difficulty. Approximately 10% of the national budget is spent on health, and the per capita gross national product is US$228.

There is no written health policy nor are there programs as such, but an attempt is made by the Government to provide an integrated general health service. These efforts are hindered by severe lack of financial and human resources, especially in the specialized fields of health care delivery.

The thrusts of the health service are in the fields of maternal and child care and family planning, control of communicable diseases, and improvement of the environment. Nutrition and health education are also recognized as areas in which increased effort should be made. The Government has indicated its commitment, along with other territories of the Caribbean, to support improved epidemiological surveillance, training of allied health personnel, and environmental health improvement activities, especially water supply.

Immunizations are conducted routinely at the hospitals and health centers and general measures are taken against tuberculosis and venereal diseases. In all these areas, however, there is room for major improvement. The Government terminated its Aedes aegypti control program in 1975 and is now employing control measures.

The country has given high priority to maternal and child health, and until 1974 had the services of a specialist in obstetrics and gynecology and one in pediatrics. The latter resigned in mid-1974 and has not been replaced The Government supports jointly with PAHO/WHO and UNFPA a maternal and child health and family planning program which is functioning satisfactorily

The Government regards protein-calorie malnutrition as a major problem. A nutrition program is being conducted which to date has achieved the following results in the dietary and pediatric services in general hospitals and the dietary service in the Mental Hospital (1) a training session for 27 workers from 16 different disciplines of maternal and child health activities with workshop and discussion sessions, (2) setting up of a referral and home visit system for malnourished children, (3) establishing suitable norms for pediatric care in pediatric and child welfare clinics, (4) other training measures including nursing curriculum revision and inservice training for persons working in the field of maternal and child care; and (5) adaptation and implementation of the use of the infant feeding manual.

The country has one acute psychiatric unit attached to the main general hospital. The unit has 15 beds and patients are cared for by a psychiatrist. There is also a Mental Hospital with 50 patients

The Government is very concerned about the state of environmental health. It is therefore collaborating with PAHO/WHO, UNDP and other Governments of the Caribbean in projects related to water supplies, water utility management, and development and training, and with PAHO/WHO, UNDP, CIDA and other Governments of the Caribbean in projects for the training of animal health assistants and a mobile veterinary laboratory service.

Three main areas of serious concern to the Government are health education, district nursing services, and laboratory services.

As in other islands of the Caribbean, there is serious weakness in the organization and administration of the health services. In the case of the lesser-developed territories such as Dominica, the difficulty is compounded by gross scarcity of human resources and financing.

Little is being done in the field of health planning due to lack of human and financial resources.

The health statistics and medical records situation is very grave. The Government is aware of the importance of the activities in this field, but lack of human and financial resources preclude the possibility of making major improvements.

Development of human resources is one of the weakest areas in the health services. Not only are there too few trained professional and allied health personnel, but also insufficient candidates with the necessary initial qualifications to put up for training. The Government, in collaboration with UNDP, PAHO/WHO, and other Caribbean governments, now participates in a regional project for the training of allied health personnel.

St. Lucia

St. Lucia is one of the Windward group of islands, with an area of 616 square kilometers and a population of 107,700 (1973 estimate, without adjustment for migration). In 1973, children under 15 years of age constituted 49% of the population, and 18.7% were women 15-44 years of age. Agriculture provides employment for most of the people The average per capita income has increased in recent years due to the growth in export and tourism Bananas, copra, cocoa, coconut oil, nutmeg, coffee and sugar are the main export products. St. Lucia has been an Associated State within the British Commonwealth since 1967.

The birth rate decreased from 41.1 live births per 1,000 population in 1972 to 39 8 in 1973, and the crude death rate from 9.3 per 1,000 population in 1972 to 7.8 in 1973, giving a natural increase rate of 3 2% in both years The fertility rate has been constant in recent years, and was 212 8 live births per 1,000 women 15-44 years of age in 1973 The infant mortality rate increased from 37 9 per 1,000 live births in 1971 to 52.3 in 1972, and decreased to 42.0 in 1973 The maternal mortality rate was 0.7 per 1,000 live births in 1971, decreased to 0.2 in 1972, but returned to 0.7 in 1973

The first twelve principal causes of death in 1973 were neoplasms, causes of perinatal mortality, cerebrovascular disease; pneumonia, heart disease, enteritis and other diarrheal diseases, hypertensive disease, bronchitis, emphysema and asthma; other infectious diseases, cirrhosis of the liver; avitaminoses and other nutrition deficiencies, and diabetes mellitus. Deaths of children under five years of age represented 31 7% of all deaths in 1973, while only 17 9% of the population fell in this age group The five principal causes of death in this age group in 1973 were causes of perinatal mortality; pneumonia; enteritis and other diarrheal diseases, avitaminoses and other nutrition deficiencies; and bronchitis, emphysema and asthma.

While the estimated expenditure on health increased from EC$3,411,110 in 1971 to EC$4,711,408 in 1973, its proportion of total national expenditure dropped from 13.7 to 10.4% in the corresponding years.

Despite the absence of a formal national health plan, medical and basic health services are being provided to as large a proportion of the population as possible through two general hospitals (289 beds), two district hospitals (63 beds), one mental hospital (168 beds), one tuberculosis sanatorium (30 beds), one private hospital (100 beds), one home for the aged and infirm (140 beds), and 26 health centers (in seven medical districts). Improvement of hospital care for patients through application of a higher nursing care standard and use of quality control measures is under consideration

Maternal and child health services are being reorganized. The proportion of births attended by trained personnel increased from 66% in 1971 to 73% in 1973. Family planning services are provided by a private association. The proportion of acceptors of contraceptive measures increased from 12 4% of women 15-44 years of age in 1972 to 18.9% in 1973. Request for UNFPA assistance in family planning is under consideration.

The 1974 nutrition survey revealed that 25% of deaths in children under five years of age was due to malnutrition and gastroenteritis. Of children in this age group, 10% were significantly underweight and 2% severely malnourished. Average

calorie intake was 90% and average protein intake 140% of the recommended allowance. The distribution of food intake was skewed, and about 75% of the households failed to meet their protein needs, while a higher percentage failed to meet their calorie needs. A low level of hemoglobin was found in 13-46% of people in different age groups. In 1973, evidence of malnutrition was found in 33% of children attending child welfare clinics. Since the establishment of a nutrition program in 1962, nutrition education has been carried out for medical and health personnel, schoolchildren and teachers through meetings, seminars, 4H Clubs, youth groups, women's associations and mass media. The use of growth charts has been introduced at clinics and hospitals. An infant feeding manual has been adopted. A national food and nutrition policy, approved by the Cabinet, is being incorporated into the National Development Plan.

A health education program to improve community participation in the health sector is being considered.

Schistosomiasis remains a problem. The Schistosomiasis Research and Control Center was established in April 1965, as a joint project of the Government, the British Medical Research Council, and the Rockefeller Foundation. Mollusciciding, improvement of water supplies, health education and chemotherapy were tried. Recent surveys showed a 50% reduction in the number of new cases and a decrease in incidence among children under 10 years of age from 22% in 1970-1971 to 7% in 1973-1974. The program is being expanded.

The reported cases of communicable diseases declined significantly in 1973, the diseases reported (and the number of cases) were measles (960), gastroenteritis and other diarrheal diseases (661), influenza (559), schistosomiasis (362), gonococcal infection (359), syphilis (340), whooping cough (188), tuberculosis (72), typhoid fever (36), bacillary dysentery (12), tetanus (7); leprosy (5), yaws (5), diphtheria (3), and poliomyelitis (1).

The incidence of indigenous malaria has remained at zero since 1964. The overall Aedes aegypti index has been reduced to 0.1%, with over 20 of the 27 localities negative for more than three consecutive cycles. The leprosy program is being strengthened. A new 15-bed chest wing for tuberculosis has been built, and conversion of the Tuberculosis Sanatorium to accommodate an outpatient department and a medical ward is under way.

Epidemiological surveillance is being provided in association with the Caribbean Epidemiology Center, and needs total review of procedures, new legislation, and suitable training of public health nurses and inspectors, laboratory staff and physicians. The immunization program needs assessment to achieve an adequate level of coverage.

In mental health, many community programs have been carried out. An alcoholic unit will soon be established.

There has been improvement of basic environmental health in recent years, with emphasis on provision of potable water and sanitary disposal of waste. The activities of the Public Health Engineering Unit and the Public Health Department have been integrated since 1972. A public health engineering laboratory is being set up for monitoring water quality and wastage. Water supply has been extended to remote areas. Solid waste disposal and pollution of coastlines remain problems.

A standard system of collecting data on all aspects of health has been established.

The number of health personnel, with rates per 10,000 population, at present are 31 doctors (2.8), 4 dentists (0.4); 2 hospital administrators (0.2), 1 veterinarian (0.1), 2 sanitary engineers (0.2); 1 health educator (0.1); 2 field nutrition officers (0.2), 9 public health nurses (0.8), 146 trained nurses (including nurse-midwives) (13.6), 44 nursing assistants (trained/untrained) (4.1), 4 radiographers/X-ray technicians (0.4), 11 laboratory technicians (1.0); 11 dispensers (1.0); 3 physiotherapists (one trained and two untrained) (0.3), 14 public health inspectors (trained) (1.3), 6 public health inspectors (untrained) (0.6), and 3 statistical and medical records personnel (trained) (0.3). Establishment of a division of health sciences at the Teachers' College has been recommended by UNDP.

St. Vincent

St. Vincent is one of the Windward group of islands, with an area of 388 square kilometers (including its Grenadines dependencies) and a population of 96,800 (1974 estimate). Nearly 20% of the population resides in the capital, Kingstown, and the rest are scattered throughout the coastland. In 1974 children under 15 years of age constituted 51.2% of the population, and 20.5% of the population were women 15-44 years of age. St. Vincent has associated statehood with Great Britain.

The main agricultural crops are bananas, arrowroot, coconuts, cassava, yams and sweet potatoes. Fishery and tourism are being promoted. The per capita income in 1972 was estimated at US$225, with a gross national product of US$20,702,000.

While the birth rate decreased almost steadily from 41.3 live births per 1,000 population in 1971 to 34.8 in 1974, the crude death rate increased from 8.2 per 1,000 population in 1971 to 10.5 in 1973, and decreased to 7.4 in 1974. The rate of natural increase was thus 2.7% in 1974, as against 3.3% in 1971. The fertility rate was 194.2 live births per 1,000 women 15-44 years of age in 1973, and 170.4 in 1974.

In 1974, the first 10 principal causes of death (with rates per 100,000 population) were hypertensive disease (107.4); enteritis and other diarrheal diseases (72.3), heart disease (65.1), avitaminoses and other nutrition deficiencies (56.8), causes of perinatal mortality (49.1), pneumonia (46.5), neoplasms (41.3), cerebrovascular diseases (32.0), whooping cough (20.7), and diabetes mellitus (27.9). The deaths of children under five years of age represented 38.5% of all deaths in 1974, while only 16.7% of the population fell in this age group. The five principal causes of death in this age group in 1974 were avitaminoses and other nutrition deficiencies, enteritis and other diarrheal diseases, causes of perinatal mortality, pneumonia, and congenital anomalies.

The maternal mortality rate (per 1,000 live births) decreased from 0.81 in 1972 to 0.59 in 1974, and the infant mortality rate (per 1,000 live births) increased from 69.6 in 1972 to 99.6 in 1973, then decreased to 63.4 in 1974. The high infant mortality rate in 1973 was due to an epidemic of gastroenteritis.

The deaths of adults 60 years and over constituted 39.9% of all deaths in 1974, while only 7.2% of the population fell in this age group. The three principal causes of death in this age group were hypertension, heart diseases, and diabetes mellitus.

The five leading causes of hospitalization in 1974, omitting normal pregnancy, were complications of pregnancy, childbirth and puerperium; accidents (other than motor vehicle accidents); diseases of the genito-urinary system; enteritis and other diarrheal diseases; and road transport accidents.

About 15% of the total national budget has been spent on health every year. In 1974, it was estimated that EC$2,910,650 was spent on health (14.7% of the total national budget), giving a per capita expenditure of EC$30.1.

Medical and health care is provided through eight hospitals and 32 visiting stations. Improvement of nursing services is under way. Integrated comprehensive maternal and child health services are being given high priority and will be further developed through international assistance. The Planned Parenthood Association, formed in 1966, is offering health education on family planning. The Government initiated a Family Planning Program in January 1975 with assistance from UNFPA.

A rapid survey carried out in late 1967 revealed that protein-calorie malnutrition was common in early childhood, especially in late infancy and in the second year of life. Gastroenteritis, respiratory infections and roundworm infections were found to be among the important conditioning factors. Food and nutrition policy is being developed. The nutrition component of the curriculum for the nursing school has been revised, nutrition surveillance through the use of growth charts set up, and use of an infant feeding manual initiated. A seminar on malnutrition and gastroenteritis sponsored

by CFNI was carried out in 1974. A health education program to improve community participation in the health sector is being considered.

Epidemiological surveillance is being reorganized to include active reporting by public health inspectors and nurses, and the immunization program is being improved. A statistical system is being established in the Ministry of Health. Island-wide *Aedes aegypti* eradication is under way.

Mental health needs attention, and there is no organized animal health program. Nearly 93.5% of urban and 60.0% of rural households have house connections or easy access to water supply. A water supply extension program is being carried out. A public sewerage system is being developed in Kingstown. Altogether, 94.3% of urban and 79.5% of rural households have acceptable domestic liquid waste disposal systems, such as septic tanks and pit latrines. There are public bath-houses in 40 localities. Solid waste disposal remains a problem.

The number of health personnel (and ratio per 10,000 population) is 17 physicians (1.8), 81 nurses (with and without midwifery) (8.6); 7 public health nurses (0.7); and 2 dentists (0.2). A division of health sciences is being established in the Ministry of Health.

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