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**STAFF APPRAISAL REPORT**

**VENEZUELA**

**ENDEMIC DISEASE CONTROL PROJECT**

**OCTOBER 2, 1992**

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Currency Equivalents

(as of June 15, 1992)

US\$1.00 = Bs 67.2  
US\$1 million = Bs 67.2 million  
US\$14,880 = Bs 1 million

Fiscal Year

January 1 - December 31

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

CORDIPLAN	Ministry of Coordination and Planning
DGSS	General Sectoral Directorate for Health
DGSSSA	General Sectoral Directorate for Environmental Sanitation
EMSA	Arnaldo Gabaldon School of Malariology
GOV	Government of Venezuela
IB	Biomedicine Institute
MINFAM	Ministry of Family
M.I.VI.CA.	Rural Housing Improvement Program
MSAS	Ministry of Health and Social Assistance
PAHO	Pan American Health Organization
SDDs	State Dermatology Departments
TDR	WHO/UNDP/World Bank Special Programme for Research and Training in Tropical Diseases
UCV	Central University of Venezuela
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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This report is based on the findings of pre-appraisal and appraisal missions which visited Venezuela in February and June 1992, respectively. The missions were comprised of Messrs. Bruce Carlson (Mission Leader), Sergio Dompieri (architect), Agostinho Cruz Marques (epidemiologist), and John Wilson (anthropologist).

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MAP IBRD 24017

**BASIC DATA SHEET****General Country Data**

1. Population Estimate (millions)	19.7	1988-90
2. Area ('000 km <sup>2</sup> )	912	1990
3. GNP per capita (US\$)	2,560	1990
4. GNP per capita Average Annual Growth Rate (%)	-1.0	1965-89
5. Income Share of Poorest 20% (%)	5.0	1988-90
6. Population Living in Extreme Poverty	22.3	1989
7. Population Living in Critical Poverty	31.4	1989

**Population Data**

1. Crude Birth Rate (per 1000)	28.7	1988-90
2. Crude Death Rate (per 1000)	5.2	1988-90
3. Annual Rate of Population Growth (%)	2.5	1988-90
4. Total Fertility Rate	3.56	1988-90
5. Maternal Mortality Rate (per 100000)	65	1980
6. Infant Mortality Rate (per 1000)	34	1988-90
7. Life Expectancy at Birth (years)	70.1	1988-90

**Health Data**

1. Population per Physician	701	1988-90
2. Population per Nurse	1,900	1984
3. Public Health Expenditures		
As percent of total central government budget	9.3	1985
As percent of GDP	2.6	1985
In per capita US\$	83	1987

**Nutrition Data**

1. Daily Calorie Supply	2,547	1988
2. Babies with Low Birth Weight (%)	9	1985
3. Calorie Intake as % of Requirements	114	1986
4. Per Capita Protein Intake (grams/day)	68	1990
5. Index of Food Production per Capita	77.6	1979-81=100

**Education Data**

1. Adult Illiteracy Rate (%)	11.9	1988-90
2. Female Illiteracy Rate (%)	10.4	1988-90
3. Gross Enrollment Ratios:		
Primary (% of school-age group)	105	1988-90
Secondary (% of school-age group)	56	1988-90
Tertiary (% of tertiary students)	22.1	1988-90
4. Public Education Expenditures		
As % of Total Central Government Budget	21.1	1985
As % of GDP	5.9	1985
In per Capita US\$	139	1987

Sources: Social Indicators of Development, World Bank International Economics Department, April 1992; World Development Report, 1991; Human Resources in LAC: Basic Indicators, July 1989, World Bank.

**DEFINITIONS**

**Incidence rate:** The number of persons contracting a disease as a proportion of the population at risk, per unit of time. The rate is usually expressed per 1,000 or 100,000 persons per year.

**Prevalence rate:** The total number of all individuals who have a disease at a particular time, or during a particular period, as a proportion of the population at risk. The rate is usually expressed per 1000 or per 100,000 persons per year.

**Active case detection:** The surveillance activities by which the health services search for new disease cases through screening exams. Active case detection is usually carried out in house by house visits conducted by trained "house visitors".

**Passive case detection:** The surveillance activities by which the health services detect new disease cases among the population presenting with symptomatic complaints.

VENEZUELAENDEMIC DISEASE CONTROL PROJECTLOAN AND PROJECT SUMMARY

**Borrower:** Republic of Venezuela

**Beneficiary:** Ministry of Health and Social Assistance (General Sectoral Directorate for Environmental Sanitation and Biomedicine Institute)

**Amount:** US\$94.0 million equivalent

**Terms:** Payable in 15 years, including a five-year grace period, at the Bank's standard variable interest rate.

**Project Objectives and Description:**

The proposed project will: (i) reduce the incidence and impact of endemic diseases in Venezuela; and (ii) strengthen the institutions responsible for endemic disease control. The project will include: (a) an Endemic Disease Control Component (71% of total costs) to support new and ongoing epidemiological surveillance activities; treatment of cases and preventive treatment; entomological surveillance and vector control; rural housing improvements to eliminate the habitat of the Chagas vector; health education activities; education and water treatment activities for cholera prevention; and innovative measures identified through operational research; and (b) an Institutional Strengthening Component (29% of total costs) to support training at all levels; development of information systems; operational research on control measures, strategies and technologies; and construction of operational bases, training facilities, and central and regional headquarters. The project will finance the contracting of civil works, provision of equipment, vehicles, construction materials, drugs and pesticides, and payment of training, technical assistance, special studies, maintenance and supervision.

**Benefits:** The principal beneficiaries of this project will be low-income populations in rural and peri-urban areas throughout Venezuela, where endemic diseases are still an important cause of morbidity. They will benefit directly through decreased risk of disease and improved health status, and indirectly through improved productivity. The project will also improve the management and technical capacity of the institutions responsible for endemic disease control, particularly in the design and evaluation of control strategies and the cost-effectiveness of disease control interventions.

**Risks:** The major risk to successful project implementation is from labor strikes which in recent years have resulted from long delays in payment of DGSSSA field workers, who are paid out of a large, centrally-managed "Laborers' Collective Contract". The MSAS and the DGSSSA agree that the flow of funds would likely improve if the DGSSSA were to manage the funds directly. The Government provided assurances at negotiations that it would maintain a mechanism, satisfactory to the Bank, providing for the management by DGSSSA of all funds for payment of its field workers. There is also a risk of delays in project implementation due to the Government's lack of experience with Bank-financed projects. To help address this problem the Bank would: (i) conduct a project launch seminar; and (ii) allocate greater resources to project supervision.

**Estimated Costs a/:**

	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
	-----US\$ millions-----		
Endemic Disease Control	54.8	54.4	109.2
Institutional Strengthening	<u>25.4</u>	<u>20.3</u>	<u>45.7</u>
<b>Total Base Costs</b>	<b>80.2</b>	<b>74.7</b>	<b>154.9</b>
Physical Contingencies	2.4	2.7	5.1
Price Contingencies	<u>21.5</u>	<u>6.5</u>	<u>28.0</u>
<b>Total Project Costs</b>	<b>104.1</b>	<b>83.9</b>	<b>188.0</b>

a/excluding taxes and duties, which are negligible

**Financing Plan:**

	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
	-----US\$ millions-----		
Government	94.0	0.0	94.0
Proposed IBRD Loan	<u>10.1</u>	<u>83.9</u>	<u>94.0</u>
<b>Total</b>	<b>104.1</b>	<b>83.9</b>	<b>188.0</b>

**Estimated IBRD Disbursement:**

	<u>Bank Fiscal Year</u>				
	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>
	----- \$US millions -----				
<b>Annual</b>	6.0	18.0	20.0	19.0	17.0
<b>Cumulative</b>	6.0	24.0	44.0	63.0	80.0
<b><u>Rate of Return:</u></b>	Not applicable				
<b><u>Map:</u></b>	IBRD 24017				

## VENEZUELA

### ENDEMIC DISEASE CONTROL PROJECT

#### I. INTRODUCTION

1.1 Venezuela is a largely urbanized country whose rapid economic growth has depended primarily on abundant oil resources. GNP per capita was estimated at about US\$2,450 in 1990, making it one of the highest in Latin America. The Venezuelan economy, and government revenues, have been highly vulnerable to swings in petroleum markets. The government has intervened heavily in oil and other productive sectors such as mining, power and steel. This course has proven highly inefficient and led Venezuela into a critical macro-economic imbalance in the late 1980s. In response, Venezuela began a major structural reform program in 1989 that has involved privatization of major government holdings, overhaul of the trade regime, and financial sector reforms.

1.2 Poverty is a significant and persistent problem in Venezuela, despite relatively high per capita income. Three-quarters of the poor live in urban areas. Living conditions deteriorated during the past decade and income distribution worsened. Real household income declined for all income groups, but the poorest were disproportionately affected: the highest income decile experienced a 17% decline over the 1982 - 1989 period in contrast to a 44% decline for the lowest decile<sup>1</sup>. In 1989, the government adopted the "Plan de Enfrentamiento de la Pobreza (PEP)" to confront poverty and protect the most vulnerable groups from the potentially adverse effects of structural adjustment reforms. The strategy supports decentralized design and management of social programs, increased private sector participation in service delivery, and a shift from generalized subsidies, such as food subsidies which were available to all, to subsidies targeting the poor. The PEP programs, which focus mainly on improving the nutrition and health status of young children and pregnant and lactating women, grew rapidly and by 1991 were budgeted for US\$595 million.

1.3 Although these new programs represent an important effort to protect especially vulnerable groups, they do not fully address fundamental problems of poor targeting, poor quality and inefficiency that characterize social sector programs. In 1991, the government announced the launching of a wider, consolidated effort called the "Megaproyecto Social" which aims to improve the performance of existing programs as well as to introduce new ones. In the health sector, a "Proyecto Salud" will seek to combine ongoing and new initiatives to improve the performance of health sector institutions and programs. Specifically, it will support the strengthening of endemic disease control (through the proposed project), basic health services at health centers (through the ongoing Social Development Project, effective in September 1991), and the quality and efficiency of hospital services (through the Hospital Modernization Project). The proposed Endemic Disease Control Project complements the GOV's efforts to shield the poor from the adverse

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<sup>1</sup> OCEI Household Survey, 1982-1989, and Garcia H. and Newman, J.L. "Poverty in Venezuela," mimeo, Division of Welfare and Human Resources, World Bank, Washington, D.C., 1988.

effects of reform and to improve targeting, coverage and administration of social services. Endemic disease control is automatically targeted to the poor since transmission of these diseases is closely linked to the social, economic, and environmental conditions associated with poverty. Investment in endemic disease control is also part of an important overall shift in health sector spending away from curative, hospital-based care and towards more cost-effective preventive health actions.

1.4 Endemic diseases, both vector and water-borne, are still an important cause of morbidity among the poor in most developing countries. The most prevalent is malaria. Although mortality from endemic diseases like malaria is low, the economic impact of these debilitating maladies is significant. Economic studies of malaria have estimated that between five to fifteen days of labor are lost for each bout of illness and in farming areas this impact is aggravated by the coincidence of peak malaria transmission with the peak labor demand of harvests. Economic calculations must also consider the long-term impact of parasitic diseases on school-age children and their capacity to learn. Other important costs include the maintenance of control programs to halt and reverse epidemics, as well as the costs of treatment at the household level. Despite the continuing epidemiological significance of tropical diseases and despite technological advances that have improved the possibilities for more effective disease control, most developing countries and international agencies have not afforded adequate attention to these problems. There are a few noteworthy exceptions such as the Onchocerciasis Control Programme in West Africa (OCP), the WHO/UNDP/World Bank Research and Training Programme in Tropical Diseases (TDR), and a handful of disease control projects in Brazil, China, the Philippines, Laos, Madagascar and others, all of which have been supported by the Bank. During the last two decades, health sector development has focused largely on other, equally important goals: expanding primary health care coverage and modernizing the hospital sector. However, the simultaneous neglect and consequent decline of disease control programs has contributed, most notably, to a major resurgence of malaria in many developing countries, including Venezuela.

## II. COUNTRY HEALTH DEVELOPMENT

### A. Population, Health and Nutrition Status

2.1 Population. Venezuela's total population has risen rapidly since the Second World War from 4.2 million in 1945 to almost 20 million in 1990. The average annual rate of growth in the 1980's was 2.6% and is expected to fall to 2.2% in the 1990s. The crude birth rate declined from 29.9/1000 in 1985 to 27.9/1000 in 1989. Total fertility has also declined gradually from 4.0 in 1982 to 3.4 in 1987. The population is relatively young with 38% under age 15. While urban areas contained 35% of the population in 1945, nearly 90% live in cities today. Caracas contains nearly one-fifth of the total population, which is largely concentrated in the coastal states of Miranda, Aragua, Carabobo, Zulia and the Federal District (which has 39%). Population density ranges from over 1,000/km<sup>2</sup> in the Federal District to under 10/km<sup>2</sup> in the Federal Territory of Amazonas.

2.2 Health Status. The nation's health indicators have generally improved over the years. The ratios of physicians and nurses to inhabitants have increased and growth in hospitals and hospital beds has kept pace with population. However, a lack of complementary inputs has had a negative impact on some important input-dependent activities such as immunization. Although infant mortality has dropped sharply since 1975, the 1990 rate of 34/1000 is still high for a country of Venezuela's income level. Moreover, infant mortality varies greatly from state to state: from 21/1000 in the Federal District to 67/1000 in Amazonas territory. Like many other developing countries, Venezuela is also undergoing an epidemiological transition. Traditional childhood diseases such as diarrhea, measles, pneumonia and malnutrition continue to be significant causes of death. At the same time, malignant cancers, heart disease, and injuries have become the leading causes of death in recent years. Another significant trend is the increasing transmission of certain endemic diseases associated with poverty such as malaria, dengue, and cholera. The health system is therefore increasingly stressed as it attempts to cope with a growing range of problems both old and new.

2.3 Nutrition. Official surveys indicate that the proportion of malnourished children rose from 14.0% to 15.3% between 1982 and 1989 and that the proportion of the population with caloric deficiency rose from 7% to 23% over the same period. In 1989, 22% of all households could not meet minimum food needs. Infants, small children, and pregnant and nursing mothers in the poorest areas of the country have been the most affected groups. Nutrition subsidies have been poorly targeted; at the time about 60% of subsidized goods were consumed by middle and high-income families.

## B. Health Sector Institutions

### Overview

2.4 The most important public health institutions in Venezuela in terms of coverage are the Ministry of Health and Social Assistance (MSAS) and the Venezuelan Social Security Institute (IVSS). MSAS is financed from the central government budget and theoretically serves the entire population. IVSS, which covers about 24% of the population, is partly financed through a universal payroll tax, partly through the Ministry of Labor budget and serves salaried employees and their families. Other social security organizations also provide health services such as the Institute for the Provision of Health Care and Social Assistance for the Employees of the Ministry of Education (IPASME) and the Health Services of the Armed Forces. MSAS and IVSS together administer about 73% of total public health expenditures; 52% and 21%, respectively. Despite the overlapping populations served, however, IVSS and MSAS have little coordination or joint planning.

2.5 The Ministry of Urban Development (MINDUR) is responsible for building new hospitals and general health infrastructure. Since there is no formal coordination between MINDUR and MSAS, the construction of infrastructure does not necessarily follow MSAS plans for maintaining or improving health services delivery. MINDUR administers about 4% of public health expenditures. The remainder is administered by various autonomous

institutions including: (i) the National Institute for Geriatrics and Gerontology (INAGER), which provides social protection, health services, and medical attention to the elderly; (ii) the National Institute of Hygiene (INH), which provides general laboratory services to the public health system (iii) the National Institute of Nutrition (INN) which is responsible for monitoring nutritional status, defining norms for requirements and necessary supplements, and buying and distributing these food supplements; (iv) the Central Office for the National Health System (OCPSS), an administrative office in charge of studies needed to implement the National Health System; (v) the Foundation for the Maintenance of Public Health Infrastructure (FIMA) which equips and maintains the existing hospital infrastructure; and (vi) the Caracas University Hospital Institute (IAHUC), a hospital and research institution.

2.6 The multiplicity of public institutions providing health services has led to many problems such as unbalanced regional distribution of infrastructure, duplication of services in some areas and lack of services in others. Management problems are aggravated by the lack of adequate information systems and, even where access to services is good, facilities often operate below capacity for lack of personnel and complementary inputs. In 1987, legislation was enacted authorizing MSAS to coordinate and regulate the quality of public health services under a "National Health System". Implementation of this legislation has met resistance from special interest groups and thus far, the proposed system has only been implemented, as a pilot project, in the state of Anzoategui.

2.7 The relatively small private sector accounts for about 23% of all hospital beds and probably provides medical care to less than 20% of the population. MSAS and IVSS make little use of contracting out medical services through the private sector. The health insurance sector has been growing rapidly, however, from about US\$97 million in 1984 to US\$164 million in 1989.

#### The Ministry of Health and Social Assistance (MSAS)

2.8 MSAS has three major institutional components: (i) the General Sectoral Directorate for Health (DGSS) which coordinates general health services, including the primary health care system; (ii) the four zones (Central, Center-West, West, and East) which are comprised of the 23 Regional Health Directorates (corresponding to the states) and which are further divided into 127 health districts; and (iii) the General Sectoral Directorate for Environmental Sanitation (DGSSSA) which is responsible for the control of endemic diseases including malaria, dengue and dengue hemorrhagic fever, Chagas disease, schistosomiasis and other intestinal parasites, yellow fever, cholera, and others (see Annex 7).

2.9 The General Sectoral Directorate for Health (DGSS). DGSS is comprised of five departments: maternal and child health, oncology, medical care, epidemiology and health promotion. Each of these departments is represented on the Permanent PHC Commission (CPAPS), which meets weekly to coordinate PHC activities. DGSS operates a network of about 3,500 urban and rural health facilities throughout the country. Approximately 955 of these

facilities are located in poor urban and rural areas.<sup>2</sup> One of most important programs under the responsibility of DGSS is the Maternal and Child Health Program. This program encompasses: (i) infant and child health, including monitoring of growth and development, immunizations, diarrheal disease control, control of acute respiratory infections, nutritional supplements, student health, and breast-feeding; and (ii) maternal health and family planning, which provides obstetrical and gynecological care with special emphasis on pre-natal care, detection of gynecological and breast cancer, prevention of sexually transmitted diseases, and contraceptive information and services. For pregnant women and infants, attention at health centers is combined with distribution of nutritional supplements, the composition and delivery of which are the responsibility of the National Institute of Nutrition (INN).

2.10 For all categories of health care providers, the hospital forms the apex of a service pyramid comprised of a network of rural ambulatories Types I and II, which provide basic preventive, curative and emergency care, and urban ambulatories Types I, II, and III, which are generally equipped to provide a broader range of health services. While MSAS has administrative control over its own ambulatories, it has limited say regarding non-Ministry ambulatories. Moreover, it exercises only nominal authority over the ambulatories that it operates in conjunction with other institutions.

2.11 The General Sectoral Directorate for Environmental Sanitation (DGSSSA). The DGSSSA was created in 1936 and has since been responsible for endemic disease control in Venezuela. It is headquartered in Maracay, Aragua. The Director, appointed by the Minister, also maintains an office in the health ministry in Caracas. DGSSSA has four sub-directorates: (i) Rural Endemic Diseases, (ii) The Arnaldo Gabaldon School for Malariology and Environmental Sanitation (EMSA), (iii) Sanitary Engineering, and (iv) Rural Housing, Sewers and Aqueducts (see Chart 1). The Rural Endemic Diseases sub-directorate is responsible for control of malaria, Chagas disease, schistosomiasis, intestinal parasites, dengue, and other vector-borne diseases including yellow fever and Venezuelan equine encephalitis. It has three divisions: Epidemiology, Vector and Reservoir Control, and Intestinal Parasites. The Rural Housing, Sewers and Aqueducts sub-directorate executes housing and housing improvement programs. These programs are an important part of the Chagas and intestinal parasite control programs. This sub-directorate also executes rural water supply and sewer projects. The Sanitary Engineering sub-directorate is responsible for the control of air, water and ground contamination and has programs for control of solid wastes, rodents, pesticides, construction, occupational health, waste water treatment, air pollution control and others. The EMSA has trained most of the professionals, inspectors and laboratory technicians that have worked in endemic disease

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<sup>2</sup> These facilities include 68 regional and district hospitals; 480 urban health centers, and 2,954 rural health centers. Health centers are operated by physicians and nurses, except in the case of Type I rural health centers, which are run by auxiliary nurses.

control in Venezuela. The school also conducts research projects relevant to disease control.

2.12 The management of DGSSSA control programs is centralized in Maracay and the institution has a strong "vertical" command structure. Management and technical staff at the central level establish policy, norms, and control strategies, provide training and in-service training, manage acquisition and supply, supervise control activities, and undertake operational research. At the same time, tactical decisions about what measures to apply, when, and where, are generally delegated, in each state and federal territory, to the zone chief (jefe de zona) and his three service chiefs (jefes de servicio) for Rural Endemic Diseases, Sanitary Engineering, and Rural Housing, Sewers, and Aqueducts. Thus, in each state and territory the control programs are determined by the local disease situation. Disease control activities are executed through strategically located operational bases or "demarcations" which are staffed by inspectors, spraymen, house visitors, and laboratory personnel.

2.13 The DGSSSA has a staff of about 5,600 including 725 managers, professionals and technicians, 1,500 administrative support, and 3,400 field workers (spraymen, house visitors, and laborers). Over 130 volunteers (local community leaders, shopowners, and religious leaders) also assist the malaria control program in Bolivar state by collecting blood slides and distributing anti-malarial drugs.

2.14 The Biomedicine Institute. Several endemic disease control programs are the responsibility of the Biomedicine Institute (IB), which is formally subordinate to both DGSS (General Sectoral Directorate for Health) and the Central University of Caracas (see Chart 2). The IB executes disease control programs for leishmaniasis and leprosy and is currently developing a strategy and program for onchocerciasis. It is recognized internationally for its important work in vaccine development and treatment for leprosy and leishmaniasis. It operates from a central headquarters in Caracas (at the Hospital Vargas) but its staff are very often in the field supervising ongoing programs. IB control program activities, primarily disease surveillance and treatment, are carried out by the personnel of the DGSS's 28 state-level Dermatology Departments (SDDs). Nurses in primary health care facilities at the local level also collaborate in the leprosy and leishmaniasis programs. The IB's primary role in these disease control programs is to determine control strategy, carry out relevant operational research, and supervise control activities in the field. The combination of operational research and disease control under a single institution has been a productive and unique characteristic of the IB which has, in particular, facilitated the development and implementation of new vaccines and vaccine therapies for leprosy and leishmaniasis. The IB receives research support from and collaborates closely with the World Health Organization (WHO) and the Pan American Health Organization (PAHO). The IB has a staff of 150 at the central level and is supported in the field by 318 personnel of the state-level dermatology services.

### C. Public Health Expenditures

2.15 Public spending on health declined sharply in real terms over the 1980s. Per capita public spending on health fell from about US\$113 in 1983 to US\$55 in 1988, and remained at this level through 1990. The MSAS budget for health services, for example, declined by over 40% over the decade. In addition, MSAS annual financing has been highly unstable due to the federal budget's dependence on oil revenues. Some MSAS hospitals recover a small fraction of costs from patients and have organized foundations to receive donations. IVSS depends largely on its Medical Assistance Fund which is financed by federal and employer contributions and payroll taxes. Although IVSS financing has been more stable in recent years (partly because the Medical Assistance Fund has run a large deficit), it declined 13% in real terms during the 1980s.

2.16 Most public financing for health is from the federal level; only 2.5% was from state and municipal governments in 1990. The states presently provide limited support in terms of personnel and equipment. They have recently received tax authority, however, and are thus expected to play a greater role in the future.

2.17 Spending in the health sector is strongly biased towards the least cost-effective ways of reducing mortality. Hospitals, for example, absorb over 80% of the public health budget. In the 1980s, MSAS spending on overhead (support, planning and administration) has grown while spending on service delivery (medical attention, disease control and prevention, and environmental sanitation) has declined. Between 1980 and 1988, spending on personnel rose from 52% to 73% of total MSAS expenditures while spending for operations and maintenance fell from 43% to 22% of total MSAS spending.

2.18 The present allocation of resources reduces the availability of complementary inputs and is reflected in serious shortages of pharmaceutical and other supplies in the public health system. Persons seeking medical attention at a public hospital, for example, must provide their own medicines, cotton, and bandages. This constitutes a form of direct user payment which bears no relationship to ability to pay, or to any criteria of what should be publicly financed. Such direct payments effectively obstruct access to the system for the poor. In addition, underfunding of maintenance has taken its toll: a 1989 MSAS survey found that 46% of existing physical infrastructure and equipment were severely run down and another 46% in need of minor repairs. Only 8% of the existing physical plant and equipment were judged to be satisfactory.

2.19 Budgeting in the public health sector is largely a process of political bargaining. This occurs at the level of the Council of Ministers which determines the total budgetary allocation for the health sector. The process is complicated by the fact that the two principal providers of health services, MSAS and IVSS, have different institutional affiliations and operate on the basis of distinct and independently established priorities and policies. First priority is given to funding personnel expenditures, and then to highly visible new programs. The remaining funds are allocated to the operation and maintenance of ongoing programs. Lack of coordination in

planning and budgeting among the large number of agencies involved in the sector has often undermined the efficiency of investments in health infrastructure and equipment. Expansion in capacity, for example, has not been accompanied by commensurate allocations to operations and maintenance. The resulting shortages of complementary inputs (vaccines, drugs and other medical supplies) is perhaps the single most serious constraint facing Venezuela's public health system today.

#### D. Major Issues in the Health Sector

2.20 The major problems in the health sector can be divided into five broad categories: (i) resource allocation: inefficient and inequitable resource allocation, reflected in a bias towards curative medicine and hospital care at the expense of preventive and primary health care, an expanding share of personnel expenditures at the expense of operations and maintenance, and increasing overhead costs at the expense of medical attention, environmental control, disease control and prevention; (ii) institutional weaknesses including, poor planning, over-centralization, lack of coordination and an inadequate information system; (iii) inequitable geographic distribution of both physical and human resources, combined with a weak referral system and an incapacity to provide the proper mix of high technology and low technology care; (iv) inappropriately skilled manpower; and (v) mismanagement of hospitals and lack of complementary inputs in both hospitals and health posts.

#### E. Government Strategy

2.21 The GOV strategy for the social sectors, in general, focuses on strengthening the supply of health, nutrition, education and housing services, targeting the most vulnerable groups, and promoting private sector and community involvement.<sup>3</sup> In the health sector, in particular, the GOV recognizes the need to redirect health spending towards preventive health care and to better target underserved populations and areas. This includes strengthening of endemic disease control. In 1992, the government launched a new program, the "Megaproyecto Social", which includes a number of health projects. The latter comprise a "Proyecto Salud" which includes the proposed Endemic Disease Control Project, the proposed Hospital Modernization Project, and the health component of the Social Development Project.

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<sup>3</sup> The GOV's Poverty Alleviation Plan focuses on (i) improving living conditions in poor urban areas through construction and repair of schools and health centers, and through credit for housing improvements in the poorest areas; (ii) expanding coverage of maternal and child health care by increasing the number of consultations and distribution of food supplements through health centers; (iii) expanding the community-based child day-care by opening additional centers and training of personnel; (iv) increasing pre-school enrollments and introducing school-feeding at that level; and (v) setting up a new program of nutritional grants (Beca Alimentaria) which benefits children in the first six grades in poor urban and rural areas.

2.22 Several steps have been suggested to make the public health delivery system function more efficiently: (i) integration of the existing health subsystems under a single National Health System as provided by law (see para. 2.6 above); (ii) remedying the current regional disparities in the coverage and quality of health services by strengthening the sectoral policy formulation and services standardization functions of the Ministry; (iii) improving the budgetary allocations to operations and maintenance and away from personnel; and (iv) shifting resources gradually from the hospital-based tertiary care to the ambulatory-based primary care and preventive public health programs.

#### F. Bank Role and Strategy

2.23 In 1989, the Bank's lending program to Venezuela was resumed, after a 15 year hiatus, and agreements were reached between the Bank and the GOV on macro-economic management, financial sector reforms, and social programs. Much of the essential restructuring and deregulation of the Venezuelan economy was completed in 1991. The Bank's efforts are now directed towards encouraging the GOV to follow prudent fiscal and monetary policies and to continue privatization, restructuring and deregulation efforts. In the social sectors, the Bank strategy has been to assist the GOV to cushion the poor from the effects of adjustment, and to improve the efficiency and equity of programs. The Bank's sector work has shown that the incidence and severity of poverty increased significantly in the last decade and that social spending has suffered from inefficiency and mistargeting. Several crucial areas have been neglected: preventive health care, pre-school and primary education, and nutritional needs of lower income groups. At the same time, a large proportion of public social spending has ultimately benefitted middle and high-income groups. Considerable room for improvement exists without excessive financial strain, but this implies reversing past trends, improving implementation capacity and strictly monitoring the impact of social programs.

2.24 In an effort to reduce the adverse impact on the poor of stabilization and adjustment programs, the GOV prepared a Social Sectors Action Program which constitutes the basic policy framework of the Bank-financed Social Development Project (Loan 3270-VE) effective in September 1991. In addition, the Technical Assistance for Preinvestment Loan (Loan 3225-VE), effective in June 1991, was designed to strengthen the GOV's capacity to select, prepare and implement sound investment projects and to build up a pipeline of projects, including health and education projects, suitable for financing by the Bank.<sup>4</sup> Technical Assistance Loan resources were used to hire two consultants to prepare the draft Public Credit Law for the proposed project and to contract a management study of DGSSSA. A Public Sector Investment Review, covering capital and recurrent expenditures in the social sectors, as well as a Public Administration Study and a Poverty Study were recently completed. A Health Sector Study is also underway and will be completed within two months. The results of these studies will assist in the identification of issues, policies and investment needs in the social sectors,

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<sup>4</sup> Also approved in FY90 were a Financial Sector Loan and a Public Enterprise Reform Loan.

and strengthen dialogue on major issues. The Health Sector Study, in particular, will provide a framework and strategy for a lending pipeline in the sector and to help the GOV design a coherent investment program. Thus far, two projects have been identified in the course of the Health Sector Study: the proposed Endemic Disease Control Project and a Hospital Modernization Project, now in preparation.

#### G. Rationale for Bank Involvement

2.25 The Bank's assistance strategy in Venezuela is to support policies and investments that will encourage economic growth and social development in a context of macroeconomic stability. The emphasis is on efficient resource allocation, increased efficiency in the public sector, support for private sector development, and the appropriate targeting and delivery of support systems to the poor. The proposed project would directly support this strategy by improving the planning and management capacity of public health institutions to control endemic diseases, improving the health status of low-income populations, and reducing economic losses due to lowered productivity. It should also be noted that disease control projects, such as this one, have high externalities; the reduction of malaria incidence in one region, for example, brings benefits of reduced risk of disease to populations in other regions as well.

#### H. Lessons Learned

2.26 The Bank has no completed health projects in Venezuela from which relevant lessons can be drawn, since the first Bank-financed human resources project for Venezuela, the Social Development Project, became effective in September 1991. There are, nonetheless, important lessons from the latter project, from the Bank's experience with endemic disease control, and from completed Bank projects in the health sector in general.

#### Human Resource Projects in Venezuela.

2.27 Government Experience. Bank experience with the ongoing Social Development Project has shown that the government has limited experience in project implementation, particularly in the social sectors. This should be taken into account in project design and in the early stages of project implementation. Supervision needs will be above average and training seminars on Bank policies and guidelines will be especially important. Senior staff turnover in Venezuela has also been high; the Bank should therefore seek assurances of staff continuity in the Project Implementation Unit and in other key managerial and technical positions at the central and state levels.

2.28 The Public Credit Law. Implementation of the Social Development Project initially met some obstacles because the text of the Public Credit Law was not fully consistent with the loan agreement. The detailed project description and implementation arrangements, as described in the text of the draft law, should receive careful consideration. In particular, appropriate flexibility should be built into the text of the law, thereby allowing for possible adjustments in project design or strategy which may become necessary in the course of project implementation. Project costs must be expressed in

US dollar equivalents with a referential exchange rate. The Law should be drafted as early as possible in project preparation, with appropriate modifications being made as necessary.

### Bank Experience in Endemic Disease Control

2.29 Flexibility. Bank experience in malaria control in Brazil and onchocerciasis control in West Africa has demonstrated the importance of operational flexibility in successful disease control. Disease situations tend to change, sometimes rapidly. People migrate and modify the environment, disease vectors and parasites develop resistance to pesticides and drugs, new control technologies are found. Endemic diseases are moving targets. This has important implications for project design and for the organization and management of disease control: program managers must have the technical capacity to recognize and respond to important epidemiological and technological changes, as well as the administrative capability to implement strategic changes as needed.

2.30 Research. Accordingly, support for operational research is of paramount importance. It has been a key component of successful disease control programs supported by the Bank in the past, providing an institutional mechanism for the systematic adjustment of control strategy. For malaria control in Brazil it has led to improved treatment schemes, new methods of vector control, and better stratification of areas at risk. For riverblindness in West Africa it has led to better treatment schemes and more effective vector control.

2.31 Human Resources. The Rondonia Health Project (Ln. 2061-BR), executed in a remote region of Brazil, faced many difficulties in staffing, training, management and supervision. The completion report for this project notes that frequent and flexible programming of Bank supervision helped deal with these problems. Programs in remote areas of Venezuela face similar constraints. The executing agencies for the proposed project and Bank supervision missions should give special attention to the preparation, supervision and maintenance of staff who work in remote areas. Assuring the adequate compensation of trained workers in such areas can help reduce worker turnover in remote places which are often key targets for disease control. MSAS must also take whatever steps are necessary to remedy the delays in payment of workers that have resulted in recent labor strikes, before the project is underway.

### General Health Projects

2.32 Less Complexity. In several completed health projects<sup>5</sup>, Bank experience has demonstrated that a few separate and simple projects are better than a very large and complex project that tries to solve many problems at once. This and Government inexperience in project implementation reinforce the need for simple project design appropriate to management capacity. The

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<sup>5</sup> For example, the Tunisia Health and Population Project, the Bangladesh Population and Family Health II Project.

Bank will follow this strategy in Venezuela. The proposed project will focus narrowly on strengthening disease control programs and institutions. It will complement other efforts, however, such as the primary health care component of the ongoing Social Development Project (which supports maternal and child health care, immunization programs, and prevention of diarrheal disease, sexually transmitted diseases, and acute respiratory infections) and the Hospital Modernization Project, now in preparation.

2.33 Civil Works. Adequate planning and budgeting for civil works (in the case of the proposed project, the construction of new operational bases at the field level) is critical to timely implementation. Project implementation is often slowed by delays in civil works. This has particularly serious consequences when other project components hinge on their completion. For the proposed project, it was therefore agreed that detailed plans for new construction during the first year of the project would be prepared, and legal title to building sites acquired, prior to implementation.

2.34 Maintenance. Adequate maintenance is a key factor for sustaining project impact and project design should include measures to encourage the continuation of maintenance beyond the project period. The Brazil Northwest Integrated Development Project, for example, noted that the failure of the project design to provide for adequate maintenance of facilities and equipment led to their deterioration and a loss of investment.

### III. ENDEMIC DISEASE CONTROL IN VENEZUELA

#### A. Epidemiological Situation and Control Strategies

##### Overview

3.1 **Malaria.** Malaria is a major public health problem in Venezuela and the problem has worsened considerably in recent years<sup>6</sup>. In the 1980s, the number of malaria cases reported in Venezuela rose dramatically from about 4,200 in 1982 to nearly 47,000 in 1990. Resurgent malaria in Venezuela is primarily associated with gold mining and rainforest settlement where human modification of the environment causes proliferation of the malaria vector and where there is a high degree of human-vector contact. The high mobility of the mining population, in particular, has been the primary cause of malaria's dispersion to other parts of the country. Malaria transmission is highest in the mining camps of Bolivar state in the east, in parts of Tachira, Zulia, Merida, and Apure states in the west, and in the coastal state of Sucre in the northeast.

3.2 Despite the present resurgence of malaria transmission and the reinfection of areas where the disease had once been eliminated, the DGSSSA maintains the long-term objective of eradicating malaria in Venezuela. Current objectives, however, take into account important constraints which are largely defined by the characteristics of the principal vectors, the behavior and susceptibility of affected human populations and the limitations of existing malaria control technologies. These objectives are to: (i) reduce the level of malaria transmission in the federal territory of Amazonas and Bolivar state; (ii) interrupt transmission definitively in Sucre state (i.e. eradication); and (iii) to reduce transmission in the western states of Tachira, Merida, Zulia, and Apure to residual levels (i.e. to control or limit the problem to rare and isolated outbreaks). Once these goals are achieved, DGSSSA would maintain epidemiological and entomological surveillance and intervene as necessary to eliminate new foci of transmission.

3.3 Malaria control strategy in Venezuela has relied primarily on diagnosis and treatment of cases, intradomiciliary spraying, aerial fogging in selected areas (where the vector is particularly exophilic<sup>7</sup>, such as A. aquasalis in coastal Sucre state, or where few sprayable surfaces exist), elimination of breeding sites (through larviciding and drainage works) and health education geared to promoting vector avoidance behavior and community participation in breeding site control. Control efforts have proven especially difficult in

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<sup>6</sup> The malaria parasite (primarily Plasmodium falciparum and Plasmodium vivax) is transmitted by the Anopheles mosquito and causes debilitating flu-like symptoms (fever, chills, sweats) that often come in cycles. The parasite attacks and destroys red blood cells and, if untreated, can be fatal (especially P. falciparum).

<sup>7</sup> An "exophilic" vector prefers to rest out doors after feeding. "Exophagic" vectors prefer to feed out doors. "Endophilic" and "endophagic" vectors prefer to rest and feed indoors, respectively.

mining camps and new rainforest settlement areas characterized by mobile populations and precarious dwellings. Intradomiciliary spraying has been less effective in such areas and parasite resistance and behavioral adaptations of the vector to insecticide use also pose important new challenges. In addition, financial constraints and labor disputes have hampered the consistent application of control measures. The malaria control program now requires a major investment to improve and adapt control technologies to new situations in the field, to strengthen the DGSSSA's human resources, and to generally strengthen the organization and management of disease control.

3.4 Chagas Disease. Chagas disease is also a public health problem in Venezuela. It is borne by triatomine bugs (Rhodnius prolixus and Triatoma maculata) which transmit the parasite Trypanosoma cruzi. The Chagas parasite causes irreversible damage to the heart, resulting in debilitation and death. Symptoms may not appear for many years after infection and there is no known cure. The vector's principal habitat is the palm thatch and mud walls of traditional houses among the rural poor. Transmission is known to occur in the states of Barinas, Merida, Trujillo, Portuguesa, Lara, Zulia, Yaracuy, Cojedes, Carabobo, Miranda, Guarico, Aragua, Falcon, Anzoategui and Sucre. About 1,500 new cases have been reported in each of the last five years. Underreporting is high, however, due to a decline in surveillance activities in recent years. The Chagas control strategy focuses on treatment of infected individuals, spraying of infested houses and associated structures, promotion of housing improvements to reduce vector density in human dwellings and health education focused on community participation in the timely reporting of reinfestation. Unfortunately, the Chagas control program has suffered serious cutbacks in recent years because of the priority allocation of DGSSSA funds to malaria and dengue control. Greater support for Chagas control will be necessary to eliminate the vector and disease transmission. This will only be achieved through a more complete coverage of areas at risk, intensified education efforts and expanded housing improvement activities.

3.5 Intestinal Parasites. Ascaris and other intestinal parasites are also common among low-income populations and especially affect children. Control efforts have focused on mass distribution of anti-helminthic drugs to school children and on latrine construction programs among the rural and peri-urban poor. Latrine construction has fallen precipitously in last decade: from over 10,000 latrines per year in the late 1970s to less than 800 in 1990. At present, the DGSSSA is solely responsible for intestinal parasite control in Venezuela. Coverage could be expanded and further improved through the involvement of the local primary health care network of the general health services in the distribution of anti-helminthic drugs.

3.6 Schistosomiasis. Intestinal schistosomiasis (Schistosomiasis mansoni) is transmitted to human populations when they are exposed (through work or leisure) to waters infested by an (infected) intermediate host snail, Biomphalaria glabrata. The parasite undergoes part of its lifecycle in the snail and is eventually released into the water. At another stage in the cycle, the snails are infected when parasites return to the water in human waste. The area most affected in Venezuela is the densely populated center-north region, including the Federal District and parts of the states of Aragua, Carabobo, Guarico, and Miranda, as well as isolated foci in Portuguesa

and Monagas. This debilitating disease, over a period of years, gradually causes damage to the liver, spleen, and intestines. In some poor rural communities, as much as 40% of the population may be infected. Epidemiological surveys have traditionally been carried out by testing fecal samples. More recently, serological methods have been developed which suggest that prevalence is much higher than was evident from feces exams. Support for new and wider epidemiological studies is therefore needed and would help to better target interventions. Although the long-term goal is to eradicate schistosomiasis in Venezuela, the present objective is to control the transmission of disease in the endemic area and to eliminate any new active foci as they appear. The control strategy involves: (i) determining the frequency and distribution of infection using more sensitive (serological) diagnostic tools; (ii) treatment of cases (using Praziquantel); (iii) snail control (mollusciciding) using chemical and biological agents; (iv) minor drainage works to eliminate infected snail populations and to reduce human contact with infested waters; and (v) health education focused on improved hygiene, proper disposal of human waste and avoidance of snail-infested waters. Given the great difficulty of keeping people and infested waters apart and of impeding the infection of snail populations through the improper disposal of human waste, especially in poor areas, education becomes a particularly crucial component in the schistosomiasis control strategy. It is also important that snail control, based on appropriate epidemiological surveys, be limited to areas of epidemiological significance.

3.7 Dengue and Dengue Hemorrhagic Fever. Dengue fever is caused by an arbovirus transmitted by the Aedes aegypti mosquito. In its most severe form, dengue hemorrhagic fever, the disease is often fatal. Since the late 1970s, when the last epidemic occurred, the Aedes aegypti eradication program was gradually cutback until coverage was limited to three states. A decade later, between October 1989 and March 1990, Venezuela suffered an epidemic outbreak of dengue with over 12,220 reported cases. For the first time in Venezuela, these included 2,780 cases of dengue hemorrhagic fever, which caused 73 deaths. Over 70% of the national territory was affected during this epidemic. A second epidemic occurred in late 1991, despite entomological surveillance efforts, and spread into new areas including Bolivar and Amazonas states. In light of these events, DGSSSA has recognized and advocated the need to establish a National Dengue and Aedes aegypti Control Program. Such a program would involve a number of public health institutions including the National Hygiene Institute (INH), the Venezuelan Scientific Investigation Institute (IVIC), and DGSS, all of which would have an important role in virological, serological, clinical and epidemiological surveillance. Within this program, DGSSSA would undertake Aedes aegypti surveillance (to monitor the vector population, its seasonal variation and sensitivity to pesticides in use) and vector control activities including intradomiciliary spraying and aerial fogging. In addition, the dengue control strategy places special emphasis on the creation of a permanent program to involve local communities in reducing vector density through better solid waste disposal and elimination of breeding sites. The eventual program goal is to reduce Aedes aegypti to a level incompatible with dengue transmission and thereafter to maintain epidemiological and entomological surveillance and vector control as needed.

3.8 Cholera. The recent cholera epidemic in South America spread to Venezuela in 1991, when 14 cases were reported. In 1992 (January to June), a total of 869 cases and 18 deaths were reported. The states most affected have been Zulia (667 cases), Aragua (103 cases) and the Federal District (59 cases). Cholera cases have also been reported in Miranda, Carabobo, Tachira and Apure states. The DGSSSA strategy for cholera control will include: (i) promotion of better hygiene among populations at risk through education activities involving both public and private institutions; (ii) chlorination of drinking water supplies to guarantee the quality of drinking water (iii) sanitary surveillance of recreational waters; and (iv) maintenance of adequate solid waste collection and disposal including surveillance of sewage and sewage treatment.

3.9 Yellow Fever. Like dengue, the yellow fever arbovirus is transmitted by the Aedes aegypti mosquito. Although not presently a public health problem in Venezuela, yellow fever can still be found in non-human primate populations. No human cases of yellow fever have been reported in decades. The control program aims to maintain eradication of the disease through: (i) public vaccination programs, especially of populations near enzootic foci; (ii) entomological surveillance of Aedes aegypti; and (iii) health education focused on promotion of voluntary vaccination.

3.10 Leprosy. Leprosy is also a public health problem in Venezuela. It is transmitted through prolonged human contact and is caused by Mycobacterium leprae. Over a period of years, leprosy causes severe skin lesions, loss of skin sensitivity, nerve lesions leading to muscle weakness and atrophy, especially in the hands and feet, and often has a serious psychological and social impact on the families affected. In January 1991, there were 13,616 registered cases and the states most affected were Merida, Tachira, Trujillo, Barinas, and Apure. Although leprosy is treatable with a new multi-drug therapy (MDT), and promising work on immunotherapy and immunoprophylaxis is underway, coverage needs to be improved in Venezuela's more remote areas such as T.F. Amazonas and Bolivar, where the state-level health services are weak. The leprosy control program is carried out by the state-level Dermatology Departments of DGSS/MSAS and managed by the IB. The control strategy focuses on: (i) the timely treatment of cases; (ii) monitoring and protection, through experimental vaccination, of intradomestic and extradomestic consanguineal contacts of confirmed cases; and (iii) targeted health education. The IB also has runs a rehabilitation program for leprosy patients.

3.11 Leishmaniasis. Leishmaniasis, a parasitic disease transmitted by sandflies, has two major forms, L. tegumentar americana or LTA (also known as cutaneous and mucocutaneous leishmaniasis) and L. visceral (Kala-azar)<sup>8</sup>. LTA is more common in Venezuela. Its symptoms range from simple skin ulcers to major tissue destruction, especially of the nose and mouth. Some forms can

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<sup>8</sup> L. visceral is rare in Venezuela. About 50 new cases are reported each year. It is usually fatal if untreated and is more difficult to treat than other forms of the disease; its symptoms include fever, malaise, weight loss, anemia, and swelling of the spleen, liver and lymph nodes.

heal by themselves, but often leishmaniasis requires difficult, expensive, and lengthy chemotherapy. In 1989, there were about 1,900 reported cases of LTA in Venezuela. However, according to the IB, underreporting of LTA may be as high as ten to one. The IB's control strategy for LTA, carried out by the SDDs, involves: (i) active case detection utilizing trained community leaders and local health services personnel; (ii) development of new diagnostic techniques; (iii) register, treatment and follow-up of cases; (iv) epidemiological studies and studies of the vector and parasite reservoirs in areas of known transmission; and (v) health education. The IB is also undertaking studies of a leishmaniasis vaccine, as well as studies on the potential use of the same vaccine for treatment. Both studies are supported by the TDR program. Vector control is not presently part of the control strategy but this option is under study. The design and implementation of vector control first requires greater knowledge of the vector, its habits, and non-human reservoirs of infection. In order to improve the LTA control strategy, the IB plans to conduct studies of the frequency and distribution of LTA and its relationship to ecological, economic and cultural factors, as well as studies of the relationship between parasite and host.

3.12 Onchocerciasis. Onchocerciasis, which is caused by a filarial parasite transmitted by blackflies (Simulium), is also found in Venezuela. The adult parasites (macrofilariae) form nodules under the skin and produce millions of offspring (microfilariae) which migrate through the tissues causing severe itching and debilitation. Eventually these microfilariae may reach the eyes, causing ocular damage and blindness. The impact of the disease is worse in areas where repeated reinfection occurs. The states known to have onchocerciasis are the eastern states of Anzoategui, Monagas, and Sucre, the central states of Aragua, Miranda, Carabobo, Guarico, Cojedes, and Yaracuy, and the southern states of Bolivar and Amazonas. The IB estimates that there were approximately 70,000 cases of onchocerciasis in Venezuela in 1990, but a comprehensive and systematic mapping of the disease, and of the incidence of onchocercal blindness, has yet to be carried out. The IB plans to begin a treatment and surveillance program under the proposed project, using the microfilaricide, ivermectin (also known as Mectizan). Studies of the feasibility of vector control, jointly with DGSSSA, are also planned. The goal of the proposed onchocerciasis control program would be to eliminate the transmission of onchocerciasis in Venezuela by the year 2011.

#### B. Financing of Endemic Disease Control

3.13 DGSSSA Financing. The DGSSSA endemic disease control programs are funded from several sources (see Annex 8): (i) MSAS; (ii) the Guayana Regional Development Corporation (CVG - a parastatal company operating in Bolivar and Amazonas); and (iii) the state governments. The state governments contribute primarily to the rural housing, aqueducts and sewers programs. The central government, through MSAS, finances most of the specific disease control campaigns, EMSA, and administration. In addition, the CVG provides a significant contribution to malaria control in Bolivar and Amazonas. Total DGSSSA expenditures for endemic disease control declined over 30%, in real terms, between 1985 and 1990, from about US\$32 million to about US\$16 million (1990 US dollars). In 1991, financing of these programs increased to about US\$25 million but still remained considerably below the 1985 level. The

budget situation worsened again, however, between 1991 and 1992. Although the 1992 budget included a 20% inflation adjustment for personnel expenditures, the remainder did not. In real terms, this represents an additional 20% decline in the DGSSSA budget for operations. As a percentage of total MSAS expenditures, funding for endemic disease control (both DGSSSA and IB expenditures) declined from over 12% in 1972 to less than 3% in 1992.

3.14 IB Financing. The IB is financed primarily by two institutions, MSAS and the Central University of Venezuela (UCV). The World Health Organization (WHO) funds part of the leprosy and leishmaniasis programs. In addition, the U.S. Agency for International Development (USAID) has supported onchocerciasis treatment among indigenous populations and NIH and Rotary Club have each supported IB research projects. IB expenditures have declined 7.5% between 1985 and 1990, primarily due to declining MSAS contributions. Total IB expenditures in 1990 for managing the leprosy, leishmaniasis and onchocerciasis programs were about US\$800,000 (excluding the SDDs expenditure and other DGSS expenditures for treatment of these diseases through the general health services).

### C. Major Issues in Endemic Disease Control

3.15 At present, the major issues and principal constraints for endemic disease control programs in Venezuela are: (i) insufficient financing for all essential operations and programs (acute problems such as malaria and dengue quickly consume most of the available resources); (ii) insufficient higher level personnel, especially epidemiologists, entomologists, social scientists and management specialists; (iii) insufficient capacity to train mid-level and field personnel; (iv) insufficient resources for essential operational research on control technologies and strategies; (v) an outdated information system; and (vi) labor strikes due to delays in payment of field workers.

#### IV. THE PROJECT

##### A. Project Concept and Objectives

4.1 Public health institutions in Venezuela today face many challenges, among them are the need to restore an appropriate balance between curative and preventive care, to strengthen the human resources and institutions necessary to execute effective public health programs, and to better target health programs to the poor. The project will therefore support specific public health programs for endemic disease control that have lost ground in recent years due to fiscal constraints and worsening epidemiological conditions. The objectives of the project are: (i) to reduce the incidence and impact (health and economic) of endemic diseases including malaria, Chaga disease, intestinal parasites, schistosomiasis, dengue, cholera, yellow fever Venezuelan equine encephalitis, onchocerciasis, leishmaniasis, and leprosy; and (ii) to strengthen the two principal institutions responsible for endemic disease control in Venezuela, the DGSSSA and the IB.

4.2 The main beneficiaries of the project will be rural and peri-urban populations throughout Venezuela, especially those in areas with high levels of endemic disease transmission. The poor will derive particular benefit since they are the population most exposed to risk of these diseases. The project will also lead to improved management and technical capacity of the institutions responsible for endemic disease control. In particular, it will help the IB and DGSSSA to improve the design and evaluation of control strategies and the cost-effectiveness of disease control interventions.

##### B. Main Features

4.3 To meet these objectives the project has two components: (i) an Endemic Disease Control Component (71 percent of total project costs); and an Institutional Strengthening Component for DGSSSA and IB (29 percent of total project costs).

##### Endemic Disease Control Component (US\$133.2 million including contingencies)

4.4 The Endemic Disease Control Component will support: (i) new and ongoing epidemiological surveillance activities for all of the endemic disease control programs (including cholera); (ii) treatment of cases and preventive treatment; (iii) entomological surveillance and vector control to interrupt the transmission of malaria, dengue, and other vector-borne diseases; (iv) rural housing improvements to eliminate the habitat of the Chagas vector and thereby reduce transmission of Chagas disease; (v) health education activities to enlist individual and community participation in the control of endemic diseases; (vi) education and water treatment activities for cholera prevention; and (vii) innovative measures identified through operational research.

**Institutional Strengthening Component** (US\$54.8 million including contingencies)

4.5 The Institutional Strengthening Component will support: (i) training activities to improve human resources at all levels, from central management to house visitors and spraymen in the field; (ii) development of information systems to strengthen epidemiological analysis (including computerized epidemiological mapping capabilities) and logistics management; (iii) an operational research fund for special studies to develop and test new control measures or to improve on existing strategies and technologies; and (iv) construction of new operational bases, training facilities, and central and regional headquarters (for DGSSSA) to support expanded program coverage.

4.6 The project will support both components through provision of vehicles, equipment, construction materials, supplies and fuel; development and purchase of educational materials; and payment of costs for vehicle operation, maintenance, technical assistance, salaries, per diems, travel and project supervision. The Endemic Disease Control Component will also support the purchase of drugs and pesticides. In addition, the Institutional Strengthening Component will support: contracting of civil works; provision of computer equipment and software; and payment of costs for training and in-service training courses, domestic and foreign fellowships and operational research.

**C. Detailed Description**

**Component A: Endemic Disease Control**

4.7 The project will include a disease control component to strengthen field operations including epidemiological and entomological surveillance, treatment of cases, vector control, and IEC activities. The project will support traditional operations such as intradomiciliary spraying for malaria and Chagas control, as well as innovative measures such as impregnated bednets for malaria control, serological studies for surveillance of schistosomiasis, and immunoprophylaxis and immunotherapy for treatment and prevention of leishmaniasis and leprosy.

**Subcomponents to be Implemented by DGSSSA**

4.8 Malaria Control. In recent years, malaria control efforts in Venezuela have been hampered by a number of problems. These include: (i) environmental modifications which create more favorable breeding conditions for the mosquito vector; (ii) increased human-vector contact because of the expansion of certain economic activities, especially gold mining and rainforest colonization, and the precarious types of housing associated with these activities; (iii) frequent migration of infected individuals; (iv) parasite resistance to anti-malarial drugs and changes in vector behavior; and (v) a decline in resources available to maintain adequate coverage. Resources are needed to reinforce traditional control strategies, as well as to develop and implement new ones. Therefore, the malaria control subcomponent will support: (i) epidemiological surveillance (active and passive case detection), treatment and education activities including promotion of personal protection

measures such as the use of bed nets; and (ii) entomological surveillance and vector control activities including intradomiciliary pesticide application, selective ultra-low-volume (ULV) fogging (e.g. in mining camps), larviciding and biological control measures (the pesticides are DDT wettable powder 60%, Temephos, Phenitrothion C.E. 50%, Phenitrothion wettable powder 40%, and Malathion C.E. 94%). These activities will be strengthened through: the purchase of vehicles (pickup trucks, jeeps, small boats, outboard motors, motorcycles), equipment (including spraying equipment and microscopes), drugs, pesticides, fuel, and supplies; the payment of costs for vehicle operation, vehicle and equipment maintenance (at 4% of cost of new goods), rental, salaries and per diems for field personnel (inspectors, visitors, spraymen, and laborers), travel and project supervision.

4.9 Dengue Control. Dengue fever reappeared in Venezuela in 1989 after a decline in Aedes aegypti control efforts. The latest epidemics also brought Venezuela's first experience with dengue hemorrhagic fever, a very serious and often fatal manifestation of the disease. Field operations have not had sufficient personnel or resources to maintain adequate coverage. After two serious dengue epidemics since 1989, DGSSSA now recognizes the need for a National Dengue and Aedes aegypti Control Program. The dengue control subcomponent of the project will therefore support epidemiological and entomological surveillance and vector control activities including pesticide application against larval and adult forms of the mosquito (Malathion C.E. 94%), small source reduction projects, solid waste disposal (undertaken by local governments) and IEC activities<sup>9</sup>. The project will support these activities through the purchase of vehicles, equipment, pesticides, fuel, and supplies; development and purchase of instructional materials; the payment of costs for vehicle operation, vehicle and equipment maintenance (at 4% of cost of new goods), salaries, per diems, travel and project supervision.

4.10 Chagas Disease Control. Despite general improvements in rural housing and many years of indoor spraying for vector control, Chagas disease is still an important public health problem in Venezuela. An estimated 3 million persons are still exposed and at risk because of poor housing conditions (mud and thatch) which provide the principal habitat of the triatomine bug, the Chagas vector. The principal control measures undertaken by DGSSSA and which will be supported by the project include epidemiological and entomological surveillance (treatment of Chagas patients is carried out by DGSS through the health care system, using the drugs Nifurtimox and Benznidazol), vector (triatomine) control using H.C.H. (Hexachlorociclohexano) and Dieldrin (to date, effective biological vector control methods have not been found). The project will support these activities through: the purchase of vehicles, equipment, fuel, pesticides (Phenitrothion wettable powder 40% and Phenitrothion C.E. 50%) and supplies; payment of costs for vehicle

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<sup>9</sup> DGSSSA is only responsible for the prevention of dengue, i.e. for reducing transmission through vector control and for maintaining epidemiological and entomological surveillance. Clinical care for dengue is carried out by other institutions, public and private, in the health care system. Support for dengue control under this project will be limited to support for actions carried out by DGSSSA.

operation, vehicle and equipment maintenance, per diems, travel and project supervision. The project will also support the M.I.VI.CA. program (Programa para el Mejoramiento Integral de la Vivienda Campesina). This program begins with education activities in poor rural areas focusing on the need to eliminate the Chagas vector (Rhodnius prolixus or "el chipo") which lives in cracks in mud walls and in palm thatch. M.I.VI.CA. therefore supports minor housing improvements such as covering cracked mud walls with wire mesh and cement and replacing thatch roofing with sheet metal. Voluntary participants sign a loan agreement to repay the costs of construction materials provided by the program, which also provides the necessary technical guidance to ensure proper construction. At the same time, the program promotes latrine construction which has many other health benefits. The project will support the M.I.VI.CA. program through the purchase of construction materials (including sand and cement for floor pavings and wall coatings, steel sheets for roofs, precast concrete sludge pits, latrines, lavatories and WCs, wooden doors and windows)<sup>10</sup>, vehicles, fuel, mobile power generators for audio-visual presentations in target communities; and payment of costs for vehicle operation, vehicle and equipment maintenance, per diems, and project supervision.

4.11 Schistosomiasis Control. Schistosomiasis control efforts have been negatively affected by budgetary cutbacks and reallocation of resources to more acute problems such as malaria and dengue. Schistosomiasis is still a problem in some areas which could be eliminated through a concerted effort of case treatment, snail control and health education. The control measures to be supported by the project therefore include epidemiological surveillance and treatment, malacological (snail) surveillance and molluscicide application and IEC activities. These activities will be supported through: the purchase of vehicles, equipment, fuel, supplies, pesticides (Baylucid), and drugs (Praziquantel); and payment of costs for vehicle operation, vehicle and equipment maintenance, per diems, travel and project supervision.

4.12 Intestinal Parasite Control. The prevalence of intestinal parasites in Venezuela is high, despite a gradual and significant decline over the past few decades. Latrine construction programs contributed to this decline but have been cut back severely in recent years. The existing program to distribute antihelminthic drugs to schools and communities has also had difficulty in maintaining adequate coverage. Latrine construction, drug distribution, and IEC activities must be expanded to meet present and future needs. The project will help to achieve this through: the purchase of vehicles, equipment, supplies, construction materials for 50,000 latrines, and drugs; and payment of costs for rent, vehicle operation, vehicle and equipment maintenance, per diems, travel and project supervision.

4.13 Yellow Fever Control. Yellow fever is not presently a public health problem in Venezuela and no cases have been reported in many years. Maintenance of eradication requires continued vaccination and surveillance of enzootic forms of the virus. The project will therefore support ongoing

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<sup>10</sup> Construction materials for the M.I.VI.CA. program will be purchased with government counterpart funds.

prevention efforts which include immunization campaigns (the goal is 100% coverage of the population at risk), entomological surveillance of sylvatic vectors and reservoirs, Aedes aegypti control, and IEC activities. The project will support these activities through: the purchase of vehicles, equipment, fuel, vaccines, and supplies; and payment of costs for vehicle operation, vehicle and equipment maintenance, salaries, per diems, travel and project supervision.

4.14 Cholera Control. The present cholera pandemic in Latin America has already affected Venezuela. In 1992 (January to June) a total of 869 cases were reported with 18 deaths. The states most affected were Zulia (667 cases), Aragua (103 cases) and the Federal District (59 cases). Cholera cases have also been reported in Miranda, Carabobo, Tachira and Apure states. The project will therefore support ongoing sanitation and education efforts which aim at the prevention of cholera, through: the purchase of vehicles, fuel, water pumps, and chlorination and other supplies; and payment of costs for vehicle operation, vehicle and equipment maintenance, salaries, per diems, travel and project supervision. This subcomponent focuses exclusively on DGSSSA's responsibilities in cholera prevention; the treatment of cholera (oral rehydration therapy) is carried out by other health sector institutions which are not among the executing agencies of this project.

4.15 Other DGSSSA Disease Control Programs. The project will also support entomological surveillance and vector control activities for Venezuelan equine encephalitis, Venezuelan hemorrhagic fever, onchocerciasis, and leishmaniasis through: the purchase of vehicles, equipment, fuel, supplies, and pesticides (Phenitrothion C.E. 40%); and payment of costs for vehicle operation, vehicle and equipment maintenance, per diems, travel and project supervision.

4.16 DGSSSA - Information, Education and Communications (IEC). This subcomponent will support DGSSSA efforts to strengthen and expand programs to educate the public about endemic disease control and to promote community participation. Specifically, the subcomponent will support a health education unit (which has already been constituted and staffed) at the central level, the formation of health education teams at the regional level and educational programs to increase community awareness of actions that communities and individuals can take to reduce the spread and impact of endemic diseases. The new IEC unit will provide guidance and technical assistance to all of the DGSSSA disease control programs, helping control program staff to integrate, strengthen and execute IEC activities in the ongoing control program strategies. Of particular importance is the contracting of IEC experts to provide technical assistance and carry out special studies and surveys. The activities of this subcomponent will be supported through the purchase of vehicles, equipment, fuel, and supplies; development and purchase of instructional materials; and payment of costs for vehicle operation, vehicle and equipment maintenance, technical assistance, salaries, per diems, travel and project supervision.

Subcomponents to be Implemented by the IB

4.17 Leishmaniasis Control. Underreporting of leishmaniasis in Venezuela is high. Its frequency and distribution and the ecological, economic and social factors in its transmission are still poorly understood. The leishmaniasis control subcomponent will therefore support: (i) strengthening of epidemiological surveillance including active case detection (involving house visitors, rural physicians, nurse auxiliaries, and local communities); (ii) registration, treatment, and control of cases; (iii) epidemiological studies of foci and cases, especially in areas affected by epidemic outbreaks where special measures may be needed; (iv) analysis, interpretation and dissemination of epidemiological information including publication of trimestral bulletins and annual reports; and (v) entomological and parasitological studies. These activities will be supported through: the purchase of vehicles, equipment, fuel, drugs, and supplies; and through payment of costs for vehicle operation, equipment and vehicle maintenance, rental of space for field bases, salaries, per diems, travel and project supervision.

4.18 Leprosy Control. The existing leprosy control program needs to be expanded especially in areas where the primary health care system is less developed. The leprosy control subcomponent will aim to reduce prevalence and incidence of the disease through the adequate and opportune treatment of cases and the protection of contacts at high risk of developing the disease. Subcomponent activities will include: (i) treatment of cases and vaccination of high risk contacts; (ii) investigation and control of contacts; (iii) epidemiological surveillance, including socio-epidemiological studies in areas of high incidence. The project will support these activities through: the purchase of vehicles, equipment, fuel, drugs and supplies; and payment of costs for vehicle operation, vehicle and equipment maintenance, rental of space for field bases, salaries, per diems, travel, and project supervision.

4.19 Onchocerciasis Control. The frequency and distribution of onchocerciasis in Venezuela is also poorly understood and there is no specific plan currently in place to treat its victims or to reduce transmission of the disease. The onchocerciasis control subcomponent will initiate control activities in Venezuela and undertake the necessary studies to develop an appropriate disease control strategy. Specifically the subcomponent will support: (i) mass distribution of ivermectin for treatment of cases (this may also have some impact on transmission); (ii) epidemiological surveillance including active case detection, registration (and treatment) and follow up of cases, and epidemiological studies of transmission foci in order to better understand transmission situations and devise appropriate control strategies; (iii) entomological surveillance and studies (vector behavior, distribution, transmission potential); (iv) studies of possible vector control activities in areas of high transmission. The project will support the above through: the purchase of vehicles, equipment, fuel, drugs and supplies; and through payment of costs for vehicle operation, vehicle and equipment maintenance, rental of space for field bases, salaries, per diems, travel and project supervision. The project will contract 18 new public health inspectors (10 for the northeast, 8 for the center-north), an entomologist to undertake vector research (for both onchocerciasis and leishmaniasis) and two sociologists.

4.20 IB - Information, Education, and Communications. A subcomponent for information, education and communication (IEC) activities for all the IB programs will aim to strengthen health education and community participation in disease control. In addition, the project will support appropriate training of local health service personnel and applied social research. The IB is planning to hire two health education specialists to prepare educational materials and develop IEC methodologies, in collaboration with the IB's epidemiologists and public health administrators. The health education specialists will work closely with rural physicians, inspectors, auxiliary nurses, and health promoters. The IB is also expecting to hire and train 60 health promoters, four sociologists and three public health nurses. The above will be supported through: the purchase of vehicles, equipment, fuel, and supplies; and payment of costs for vehicle operation, vehicle and equipment maintenance, salaries, per diems, travel, and project supervision.

#### Component B: Institutional Strengthening

4.21 The project includes an institutional strengthening component to help DGSSSA and IB to improve their understanding of disease situations and their determinants, to develop and improve the human resources needed to carry out control programs, to improve, through operational research, the tools needed to combat endemic diseases, and to improve infrastructure.

#### Subcomponents to be Implemented by the DGSSSA

4.22 DGSSSA - Training and In-Service Training. The project will support the following training activities to be carried out primarily by the Arnaldo Gabaldon School of Malariology and Environmental Sanitation: (i) training courses for managers, administrative personnel, and field personnel in management, administration and field operations, as well as a new entomology course; (ii) preparation and production of instructional materials; (iii) fellowships in epidemiology, parasitology, entomology and other specialized areas (domestic and foreign); and (iv) creation of three field research and training stations in Amazonas, Barinas and Sucre states (see DGSSSA - Infrastructure subcomponent below). These activities will be supported through: the purchase of vehicles, equipment and fuel; payment of costs for vehicle operation, vehicle and equipment maintenance, fellowships (foreign and domestic), salaries, per diems, technical assistance, and training courses; and development and purchase of instructional materials.

4.23 DGSSSA - Strengthening Administration and Management. This subcomponent will provide for technical assistance to strengthen DGSSSA management through hiring of consultants and contracting of special studies. It will also finance contracting of auditing firms. Assurances were obtained at negotiations that DGSSSA would: (i) carry out a management study, not later than March 31, 1993, to review the organization and management structure of DGSSSA and make recommendations to improve such structure; (ii) not later than June 30, 1993, based on the above-mentioned management study and the Bank's comments thereon, present an action plan, satisfactory to the Bank; and (iii) thereafter implement such action plan in a manner and under a timetable satisfactory to the Bank (para 7.1g). Assurances were also obtained at negotiations that the executing agencies would carry out studies, not later

than March 1, 1993, to develop appropriate indicators of the impact of institutional development activities supported under the project (para 7.1h).

4.24 DGSSSA - Information Systems Development. Conventional manual methods of information management are no longer adequate to the needs of DGSSSA, given the large volume of epidemiological and administrative information generated by its disease control programs. Development of DGSSSA's information systems capacity is urgently needed to help the institution develop and implement better disease control strategies and programs. In particular, a computerized epidemiological mapping system would greatly enhance disease control efforts. Applied research carried out by DGSSSA would also benefit. Furthermore, up-to-date information systems technology and training would also provide DGSSSA with improved access to national and international health sector information networks that would be useful in combating endemic diseases. This subcomponent will enhance DGSSSA information systems through: the purchase of computer equipment, software, and supplies; and payment of costs for maintenance, salaries, per diems, technical assistance, travel and project supervision.

4.25 DGSSSA - Operational Research. The project will support operational research for the DGSSSA. Proposed studies will be submitted to a Research Steering Committee comprised of experts in endemic disease control research (para. 4.36). This subcomponent will include support for payment of salaries and per diems, as well as for purchase of supplies, vehicles, equipment and other goods or services essential to the research activities. It will also support renovation of facilities up to a maximum of US\$5000 per proposal. DGSSSA has already identified a number of possible research projects and priorities:

(a) Malaria: (i) studies of risk factors (social, entomological, parasitological, and therapeutic), in order to achieve a more accurate understanding of the malaria problem in Venezuela and, consequently, to better stratify affected areas; (ii) evaluation of new diagnostic techniques (parasitological, immunological, molecular) for population studies; (iii) studies of new biological and chemical alternatives for vector control.

(b) Chagas Disease: (i) studies of housing types by region; (ii) longitudinal studies of life expectancy in Chagas patients; (iii) evaluative studies of M.I.VI.CA. rural housing improvement program's impact on Chagas transmission; (iv) studies of alternative materials to reduce housing improvement costs; (v) studies on improving the local "bahareque" (mud and thatch) construction technology.

(c) Schistosomiasis: (i) studies of factors in schistosomiasis transmission in the human and intermediate snail host; and (ii) studies of biological control alternatives (e.g. introduction of plants lethal to Biomphalaria glabrata such as Phytolacca octandra, or introduction of other snail species such as Thiara tuberculata and Thiara granifera, which compete with the intermediate snail host).

(d) Dengue: (i) studies of combined dengue/yellow fever control efforts in rural and urban areas; (ii) follow up studies concerning densities

and vector potential of Aedes aegypti and other eventual vectors (i.e. Aedes Albopictus); (iii) studies of horizontal and vertical transmission potential of local vectors; (iv) susceptibility of Aedes aegypti to commonly used pesticides; and (v) application of molecular biology in diagnosis of dengue and yellow fever.

(e) Intestinal Parasites: (i) studies of the efficacy of new antihelminthic drugs; (ii) evaluation of the impact of control efforts on prevalence and parasite loads; (iii) studies of impact of sanitation efforts and education programs on pre-and primary school students.

4.26 DGSSSA - Infrastructure. The DGSSSA infrastructure subcomponent will include completion of construction of a new central headquarters in Maracay, a project which has been underway for eight years under the aegis of MINDUR. The new headquarters would serve the important purpose of physically consolidating all DGSSSA departments, which must work in close coordination, but which are presently spread out across the city of Maracay. The long delay in completing the new headquarters has been due to the fact that it must compete annually with other MINDUR priorities (not DGSSSA priorities). Although the headquarters may be a DGSSSA priority, the institution has been unable to sustain sufficient funding from MINDUR to complete the project in a reasonable period. Support for the new headquarters under the Endemic Disease Control Project is therefore essential. The project will also support the construction of nine regional headquarters, 25 operational bases, and three field-training bases. In addition, the project will support the expansion of the EMSA research center (EMSA Research Division) and the civil works services required to install the DGSSSA Information System. The project will support these activities through the contracting of construction firms, purchase of equipment, and payment of equipment and building maintenance costs.

Subcomponents to be Implemented by the IB

4.27 IB - Training and In-Service Training. The project will support training and in-service training for the leprosy, leishmaniasis and onchocerciasis programs including training for physicians, public health auxiliaries, health promoters, and foreign fellowships.

4.28 The project will support the above activities through: the development and purchase of instructional materials; purchase of equipment; and payment of costs for equipment maintenance, foreign fellowships, salaries, per diems, travel, technical assistance, and project supervision.

4.29 IB - Information Systems. The IB currently employs 15 information systems personnel including one system engineer, two system analysts, one computer programmer, and eleven data entry technicians, and has three computer networks, three servers, and 15 stations. The IB has developed and uses specialized software systems for the management of the Leprosy Immunoprophylaxis Program, the National Leprosy Register, the Leprosy Chemotherapy Program, the Leishmaniasis Immunoprophylaxis Program, the Leishmaniasis Register, and the Leishmaniasis Immunotherapy Program. At the state and local level, however, only the Dermatology Service of Apure state has a computerized information system. Expansion of disease control

activities will increase the IB's information systems needs. Therefore, the project will support comprehensive development of IB information systems including: (i) development and implementation of a computerized epidemiological mapping system; (ii) establishment of an information system for the onchocerciasis control program; and (iii) development of the information systems capacity of the Dermatology Services at the state level. These activities will be supported through: the purchase of new computer equipment, software, and supplies; construction of the necessary civil works for computer installation; and payment of costs for equipment maintenance, technical assistance, salaries, per diems, travel, and project supervision.

4.30 IB - Strengthening Administration and Management. The project will provide management and administration training to physicians and administrative support staff of the control programs executed by the Dermatology Services in all states. Training will include three-day modular courses on specific activities for personnel at the state and local levels and appropriate courses for administrative personnel at the central level (in areas such as inventory and personnel administration). In addition, the project will provide for three-month higher level management training courses for each of the directors of the national leprosy, leishmaniasis and onchocerciasis programs. The project will support these activities through the purchase of equipment and supplies; development and purchase of instructional materials; and payment of costs for salaries, per diems, travel, rental of training sites, and project supervision. Assurances were obtained at negotiations that the executing agencies would carry out studies, not later than March 1, 1993, to develop appropriate indicators of the impact of institutional development activities supported under the project (para 7.1h).

4.31 IB - Operational Research. The project will support operational research for the IB. This subcomponent will include support for the same items, and utilize the same review process, as described in para. 4.25 above and 4.36 below. The IB has identified a number of priority areas for study:

(a) Leishmaniasis: (i) clinical, immunological, and etiological studies in high risk areas; (ii) studies of reservoirs; and (iii) studies in immunoprophylaxis, immunotherapy, and other alternative therapies.

(b) Leprosy: (i) risk factor studies; (ii) socio-epidemiological studies (especially in Apure, Tachira, and Merida states); and (iii) studies of immune deficiency in leprosy patients and its relationship to different forms of the disease.

(c) Onchocerciasis: (i) studies in epidemiology, ophthalmology, immunology, drug toxicity, and parasitology; and (ii) studies of vector (Simulium) distribution and transmission potential.

(d) Socio-Epidemiological Research: Studies aimed at the improvement of health education and community participation.

4.32 IB - Infrastructure. The project will support the construction of six training centers and 41 rural houses which will provide fundamental support to the work of the Dermatology Services in areas of high transmission of leprosy, leishmaniasis, and onchocerciasis. This will facilitate field operations and reduce transport and personnel costs, since all programs are presently planned and executed out of state capitals. The training centers will provide training for public health auxiliaries in dermatology and in prevention and rehabilitation of disabled leprosy patients. A rural house will also be constructed adjacent to each of the five training centers. The remaining rural houses will serve as operational bases and provide housing for the public health auxiliaries of the control programs. Construction will be executed by the DGSSSA/Rural Housing Directorate. Sites will be solicited, as donations, from local municipalities, or will be purchased. The schools and half of the houses will be built in 1993, and the remainder in 1994. The project will support the above through the contracting of construction firms through the DGSSSA and will include building maintenance costs on a basis of two percent per year of the cost of new construction. The project will also support purchase and maintenance of equipment on the basis of four percent per year of the cost of new equipment.

#### D. Project Management and Implementation

4.33 Project Management. The project will have two executing agencies, the IB and the DGSSSA, which will be responsible for implementation of the project. Each agency will have a separate Project Implementation Unit (see Chart 3 and Chart 4). The heads of these two agencies will serve as co-directors of the project and will delegate authority for project implementation to project managers in their respective Project Implementation Units. Each project manager will be supported by a small staff of five or six persons and will rely largely on existing personnel and administrative mechanisms. Under the project, the DGSSSA will hire a project manager, three assistant managers, and three supervisors, and the IB will hire a project manager and one assistant manager, to complement existing staff. The project managers and staff dedicated to project implementation will: (i) ensure effective and timely implementation of project activities; (ii) monitor and coordinate overall progress and disbursement of the Bank loan; (iii) submit to the Bank annual physical and financial reports on the status of the project; (iv) coordinate with public and private institutions; (v) manage the procurement of works, goods and services, including ICB, in accordance with Bank guidelines; (vi) arrange for timely audits of project accounts; and (vii) prepare Part II of the Project Completion Report.

4.34 In addition, the MSAS will establish and maintain a Project Steering Committee (see Chart 5) for purposes of the overall coordination of the project. It will be comprised of the directors of the executing agencies, the managers of the project implementation units, and a representative of the Proyecto Salud/MSAS. The MSAS will also establish and maintain a Project Procurement Committee (see Chart 5) for purposes of assisting the executing agencies in all procurement activities under the project. It will be comprised of representatives from both executing agencies and other officials of the MSAS. Assurances were obtained at negotiations that the executing agencies would maintain the Project Implementation Units, Project Steering

Committee, Procurement Committee and Research Steering Committee throughout the execution of the project (para. 7.1e).

4.35 Assurances were obtained at negotiations that the executing agencies will participate in annual reviews (by March 30 of each year), jointly with the Bank, focusing on: (i) evaluation of progress in project execution and achievement of project objectives, based on the implementation schedule and agreed monitoring indicators (see Annexes 5 and 6); (ii) review of proposed annual budgets for the project and for endemic disease control programs for the subsequent year; (iii) any changes in project design and implementation that may be necessary (including the possible effects of decentralization in the health sector); and (iv) the mechanism providing for the management by DGSSSA of all funds for payment of DGSSSA's field workers. Upon the Bank's recommendation, any required adjustments would be made in project implementation in order to attain the agreed objectives (para. 7.1b).

4.36 Operational Research Steering Committee. The operational research subcomponents will be managed by a Research Steering Committee. The Steering Committee will be comprised of experts on research in endemic disease control who will be selected by the executing agencies. The executing agencies will use a model research proposal based on the TDR format (WHO/UNDP/World Bank Special Program for Research and Training in Tropical Diseases). The Research Steering Committee will approve or not approve proposals based on their scientific merit and compatibility with operational research priorities as defined by the IB and DGSSSA. Prior to their submission to the Steering Committee, the research proposals will be sent to the Bank for comment. The executing agencies brought to negotiations Operational Research Regulations which set forth the criteria and procedures for regulating the operation of this subcomponent. Assurances were obtained at negotiations that the executing agencies will implement the operational research subcomponent in accordance with the Operational Research Regulations (para. 7.1d).

4.37 Implementation Schedule. The proposed project will be implemented over a period of approximately five and a half years and is expected to be completed by December 31, 1997. The closing date will be June 30, 1998. The cost schedules prepared for the various components (see Annex 1) and the implementation schedule (Annex 5) will serve as a basis for planning of project implementation and will be updated regularly during the course of the project. Throughout project implementation and during regular project reviews with Government, the Bank will give particular attention to the effectiveness and efficiency of implementation of project components and agreed actions, and changes will be agreed and implemented as needed. Assurances were obtained at negotiations that the executing agencies will, by March 1 of each year: (i) submit a report to the Bank, for its review and comments, on progress in implementation of all project components and any proposals for adjustments in project implementation; and (ii) submit to the Bank, for its review and approval, a proposed annual investment program providing for the activities, implementation schedule and targets, and proposed project budget for the then upcoming year, based on the implementation schedule in Annex 5 (para. 7.1a).

4.38 Assurances were obtained at negotiations that the Government will, in respect of endemic disease control programs: (i) during the last quarter of

each fiscal year, exchange views with the Bank on budgetary needs, through the executing agencies; (ii) in each fiscal year, furnish evidence satisfactory to the Bank showing that the final proposed MSAS budget includes adequate allocations in the opinion of the Bank, not later than 15 days after the Ministry of Finance has received the respective final proposed budget of MSAS; (iii) not later than May 31 in each fiscal year, furnish evidence satisfactory to the Bank of the final proposed budget for the then following fiscal year, submitted by the Borrower's Executive Branch to the Borrower's Congress; and (iv) not later than March 1 in each fiscal year, furnish evidence satisfactory to the Bank showing the amount of expenditures incurred in the then previous fiscal year (para. 7.1i).

4.39 Monitoring and Evaluation. A list of key input and outcome indicators of project implementation to be used in regular implementation reviews is provided in Annex 6. Implementation of project activities will be regularly monitored, covering all disease control programs and all subcomponents of the institutional strengthening component. Both executing agencies will carry out studies, during the first year of the project, to develop appropriate indicators to monitor the impact of institutional development activities.

V. PROJECT COSTS, FINANCING, PROCUREMENT AND DISBURSEMENTS

A. Project Costs

5.1 The total project costs including contingencies and an estimated US\$83.9 million (44.6%) in foreign exchange costs, is estimated to be US\$188.0 million equivalent. Tables 5.1 and 5.2 summarize the estimated costs by project component and category of expenditure. Detailed costs are presented in Annex 1.

5.2 Base Costs and Contingencies. Base costs are expressed in June 1992 prices, and exclude taxes and duties, which are negligible. Civil works costs were based on estimated unit costs for the type of buildings proposed. The costs of construction materials were based on the experience of MSAS. Equipment and furniture costs were based on prices for similar imported or locally available items. The costs of drugs and pesticides were based on the procurement experience of MSAS. Overseas and domestic training and costs of foreign and local consultants were based on current standards. Operating costs were based on current estimates of salaries and operating requirements. Total contingencies of US\$33.1 million represent 21.4% of base costs. Physical contingencies (US\$5.1 million) represent 3.3% of base costs; price contingencies (US\$28.0 million), about 18.1% of base costs, were estimated on the basis of the implementation schedule and expected annual price increases as follows: (a) local: 25% for 1993, and 20% for 1994, and 15% for subsequent years; and (b) foreign: 3.9% for 1993 and 1994 and 3.8% for subsequent years. The exchange rate estimates for the midpoint of each calendar year are as follows: Bs 67.2 for 1992; Bs 74.5 for 1993; Bs 78.9 for 1994; Bs 83.8 for 1995; Bs 88.9 for 1996; and Bs 94.2 for 1997.

Table 5.1: SUMMARY OF PROJECT COSTS BY COMPONENT a/  
(US\$ million)

Component	Local	Foreign	Total	% Foreign Exchange	% Total Base Cost
A. Endemic Disease Control	54.8	54.4	109.2	49.8	70.5
B. Institutional Strengthening	<u>25.4</u>	<u>20.3</u>	<u>45.7</u>	<u>44.4</u>	<u>29.5</u>
TOTAL BASE COSTS	80.2	74.7	154.9	48.2	100.0
Physical Contingencies	2.4	2.7	5.1	52.8	3.3
Price Contingencies	<u>21.5</u>	<u>6.5</u>	<u>28.0</u>	<u>23.1</u>	<u>18.1</u>
TOTAL	104.1	83.9	188.0	44.6	121.4

a/ net of taxes and duties which are negligible.

Note: Exchange rate of Bs. 67.2 = US\$1.00.

**Table 5.2: SUMMARY OF PROJECT COSTS BY CATEGORY OF EXPENDITURE**  
(US\$ million)

Category	Local	Foreign	Total	% Foreign Exchange	% Total Base Cost
Civil Works	8.9	6.5	15.4	42.0	10.0
Construction Materials	15.9	4.1	23.0	31.0	14.9
Equipment	0.5	4.6	5.1	90.0	3.3
Instructional Materials	0.7	0.3	1.0	27.0	0.6
Vehicles	1.1	9.5	10.6	90.0	6.8
Drugs	0.0	7.8	7.8	100.0	5.1
Pesticides	0.0	22.1	22.1	100.0	14.3
Technical Assistance	1.5	1.5	3.0	50.0	1.9
Operational Research a/	4.4	4.5	8.9	50.0	5.7
Training	1.4	1.5	2.9	52.6	1.9
Project Management	1.7	0.2	1.9	10.0	1.2
Supervision	8.3	0.9	9.2	10.0	5.9
Maintenance Materials	2.0	2.2	4.2	53.0	2.7
Operating Costs	<u>33.8</u>	<u>6.0</u>	<u>39.8</u>	<u>15.0</u>	<u>25.7</u>
<b>TOTAL BASE COSTS</b>	<b>80.2</b>	<b>74.7</b>	<b>154.9</b>	<b>48.2</b>	<b>100.0</b>
Physical contingencies	2.4	2.7	5.1	52.8	3.3
Price contingencies	<u>21.5</u>	<u>6.5</u>	<u>28.0</u>	<u>23.1</u>	<u>18.1</u>
<b>TOTAL</b>	<b>104.1</b>	<b>83.9</b>	<b>188.0</b>	<b>44.6</b>	<b>121.4</b>

a/ includes support for renovation of laboratories, laboratory equipment and vehicles (see para. 5.9 and Table 5.4)

5.3 **Foreign Exchange Costs.** Direct and indirect foreign exchange costs are estimated at about US\$83.9 million equivalent, including contingencies. Based on Bank experience with similar projects in the region, the foreign exchange component for the major categories was estimated as follows: (a) civil works, 42%; (b) construction materials, 31%; (c) equipment, 90%; (d) technical assistance and operational research, 50%; (e) maintenance, 53%; (f) domestic training, 50% and overseas training, 100%; (g) instructional materials, 27%; (h) operating costs, 15%; (i) pesticides and drugs, 100%; (j) vehicles, 90%; and (k) supervision and project management, 10%.

#### B. Financing

5.4 The proposed loan of US\$94.0 million will finance the equivalent of 100% of the foreign exchange component of the project and about 9% of the local cost. The Bank loan will be made to the Republic of Venezuela which will provide counterpart funds as necessary to complete the project. The loan will be for 15 years including a five-year grace period. Eligible expenditures made after March 9, 1992 and in accordance with Bank procurement

guidelines, up to an amount of US\$9.4 million, would be financed retroactively. The financing plan and loan allocations by category of expenditure are presented in Table 5.3.

**Table 5.3: FINANCING PLAN**  
(US\$ million equivalent)

<u>Category of Expenditure</u>	<u>Government</u>	<u>IBRD</u>	<u>Total</u>	<u>Proposed IBRD (%)</u>
Civil works	9.1	9.0	18.1	50
Construction materials	24.9	4.8	29.7	16
Equipment and instructional materials	0.7	5.9	6.6	90
Vehicles	0.0	10.9	10.9	100
Drugs	0.0	9.1	9.1	100
Pesticides	0.0	25.6	25.6	100
Technical assistance and operational research a/	0.0	14.1	14.1	100
Training and project management	0.0	5.7	5.7	100
Supervision and maintenance	8.1	8.9	17.0	52
Operating costs	<u>51.2</u>	<u>0.0</u>	<u>51.2</u>	<u>0</u>
<b>TOTAL</b>	<b>94.0</b>	<b>94.0</b>	<b>188.0</b>	<b>50</b>

a/ Operational research includes support for renovation of laboratories, laboratory equipment and vehicles (see para. 5.9 and Table 5.4).

5.5 **Recurrent Costs.** Incremental recurrent costs, including contingencies, are estimated at about US\$68.2 million. This total includes some US\$17.0 million for supervision and maintenance (for buildings, equipment and vehicles) and about US\$51.2 million in operating costs, which consist mainly of salaries, per diems, fuel and supplies. About US\$8.9 million of the supervision and maintenance costs would be financed from the Bank loan on a declining basis. The operating costs would be financed entirely from the MSAS budget throughout the life of the project.

### C. Procurement

5.6 **Civil Works.** The cost of civil works under the project (about US\$18.1 million<sup>11</sup>, including contingencies) would involve construction of: a central headquarters in Maracay (two buildings totalling some US\$7.0 million), nine (9) regional offices (at about US\$1.1 million per building), expansion of DGSSSA's research center (at about US\$0.2 million) and a number of smaller works (totalling US\$1.0 million). Contracts for works exceeding US\$3.0 million would be procured through international competitive bidding (ICB) procedures. Otherwise, most other works, would be awarded according to local

<sup>11</sup>This figure does not include the estimated US\$0.3 million for facility renovation under operational research (para. 5.9)

competitive bidding (LCB) procedures, acceptable to the Bank, which would allow foreign bidders to participate, up to an aggregate amount of US\$10.1 million. To the extent practicable, the construction of regional offices will be grouped in packages of US\$3.0 million or more. The smaller works (most of which are below US\$25,000 and none of which exceed US\$100,000), including three field training bases, 25 operational bases, 6 training centers and 41 rural houses, would be procured by the DGSSSA through force account procedure based on predetermined labor unit costs and competitive procurement of construction materials from a list of approved suppliers, up to an aggregate amount of US\$1.0 million. The MSAS would be responsible for procuring the civil works and for contracting engineering firms to supervise the construction of major civil works. The DGSSSA would use its own experienced and qualified engineers, of its Rural Housing Directorate, to supervise the smaller works.

5.7 Goods. The total cost of goods (including construction materials, equipment, instructional materials, and vehicles and excluding chemicals) is estimated at about US\$47.2 million<sup>12</sup>, including contingencies. Of this total, about US\$20.1 million (construction materials for the rural housing program) would be financed entirely by the GOV. Of the remaining goods (about US\$27.1 million), more than one-half (US\$14.4 million) would be procured through international competitive bidding (ICB) procedures in accordance with Bank guidelines and the remainder (US\$12.7 million) through ICB or local shopping procedures satisfactory to the Bank. Contracts in excess of US\$200,000, and vehicles, would be awarded on the basis of ICB. Groups of items estimated to cost less than the equivalent of US\$200,000 would be procured in accordance with LCB procedures, up to an aggregate amount equivalent to US\$1.0 million. Items estimated at less than US\$25,000, including equipment, instructional materials and construction materials for some 50,000 latrines, would be procured on the basis of quotations from at least three suppliers. These items would not exceed an aggregate total of US\$11.7 million equivalent.

5.8 Chemicals. The total cost of drugs is estimated at about US\$9.1 million. Drugs, up to an aggregate amount equivalent to US\$8.0 million, would be procured through an agent following limited international bidding procedures on the basis of evaluation and comparison of bids invited from a list of at least three qualified suppliers. The signing of a services agreement between the MSAS and a procurement agent will be a condition of disbursement. Drugs would also be procured from the United Nations Children's Fund (UNICEF) in accordance with procedures acceptable to the Bank, up to an aggregate amount equivalent to US\$1.1 million. Most of the pesticides (total cost estimated at US\$25.6 million) would be procured through international competitive bidding (ICB) with prequalification, acceptable to the Bank. The DGSSSA would maintain a list of prequalified suppliers which would be updated yearly, and the time allowed for submission of bids would not exceed 15 days.

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<sup>12</sup>This figure does not include the estimated US\$3.0 million for equipment nor the estimated US\$0.5 million for vehicles under operational research (para.5.9).

The Bank would only finance the procurement of pesticides included in an agreed pesticide list.

5.9 Technical Assistance and Operational Research. The total cost of consultants, including auditors, and studies (operational research) is estimated at US\$14.1 million. The selection and appointment of consultants for studies and technical assistance will be in accordance with the August 1981 "Bank Guidelines for the Use of Consultants." Foreign consultants would not be subject to prior registration as a condition of their participation in the selection process. Registration would be a pre-condition, not of selection, but of contracting of consultants' services. The operational research component would include funding for equipment (principally laboratory equipment), the renovation of laboratories (maximum of US\$5,000 per research proposal) and vehicles for field activities. The equipment for operational research projects (estimated at US\$3.0 million) would be packaged, as far as possible, in groups of items valued at US\$200,000 or more and procured through ICB. Groups of items costing less than the equivalent of US\$200,000 (given the specialized and diversified nature of the equipment) would be procured through international shopping (at least three price quotations from at least two countries), not to exceed an aggregate total of US\$0.9 million. Basic equipment items in bid packages estimated at less than US\$25,000 would be procured on the basis of quotations from at least three suppliers, not to exceed an aggregate total of US\$100,000. The contracts for the renovation of facilities (estimated at US\$0.3 million) would be awarded on the basis of comparison of price quotations obtained from at least three eligible contractors. The vehicles (estimated at US\$0.5 million) would be procured in accordance with LCB procedures acceptable to the Bank.

5.10 Training and Project Management. The costs of training and project management are estimated at US\$5.7 million. The major expenditures are as follows: (i) training would include fellowships (domestic and international), courses, workshops and seminars, etc. and related travel and per diems; and (ii) project management would include the costs of managers and technicians on fixed-term contracts for the life of the project.

5.11 Miscellaneous Costs. The costs of supervision and maintenance (estimated at US\$17.0 million) would cover the travel and per diems of personnel of the Executing Agencies in connection with project supervision, and the maintenance of buildings, equipment and vehicles financed under the project. These costs would be financed by the Bank on a declining basis. The total cost of operating costs (salaries, per diems, fuel and supplies) is estimated at US\$51.2 million and would be financed by the GOV.

5.12 Margin of Preference. For the purpose of comparing foreign and local bids under ICB, domestic manufacturers will be allowed a margin of preference equal to the existing rate of customs duty applicable to competing imports or 15% of C.I.F. price at port of entry, whichever is lower.

5.13 Procurement Law. A Country Procurement Assessment Report was completed in June 1990. Subsequently, in August 1990, the GOV issued a Procurement Law which expressly states that all contracts for goods, works, and services which will be totally or partially financed by international

organizations with their own procurement guidelines will be undertaken in accordance with such guidelines.

5.14 Bank Review Requirements. The Bank would review and approve before contract award all procurement documentation for works, goods and pesticides to be procured through ICB, for goods estimated to cost more than US\$200,000 equivalent, for drugs estimated to cost more than US\$100,000 equivalent and for the first two contracts each project year for procurement of goods under LCB which exceed US\$100,000 equivalent. Prior Bank review of procurement documentation for contracts for works above US\$500,000 equivalent would also be required. Prior Bank review of procurement documentation would cover about 80% of the total amount of works, goods and chemicals financed by the Bank. For consultants' contracts below US\$25,000 equivalent (except for research projects), the Bank's prior review would cover only terms of reference. Other contracts and bid evaluations would be subject to selective post-award review by Bank staff. Agreement was reached at negotiations that all procurement for goods, works and services will be made on the basis of standard bidding documents, satisfactory to the Bank.

5.15 Reporting. Procurement information will be collected and recorded as follows:

- (a) prompt reporting of contract award information by the implementing agencies;
- (b) comprehensive semi-annual reports by the borrower, indicating any revision in cost estimates for individual contracts and the total project; any revisions in the timing of procurement actions; and compliance with aggregate limits on specified methods of procurement; and
- (c) a completion report by the borrower within three months of the closing date.

5.16 The aforementioned procurement arrangements are summarized in Table 5.4 below:

**Table 5.4: Summary of Proposed Procurement Arrangements**  
(US\$ million equivalent)

Project Element	Procurement Method			N.B.F.	Total Cost
	ICB	LCB	Other		
<b>1. Works</b>					
1.1 Buildings	7.0 (3.5)	10.1 (5.0)	1.0 a/ (0.5)	---	18.1 (9.0)
1.2 Laboratory Renovation			0.3 b/ (0.3)	---	0.3 (0.3)
<b>2. Goods</b>					
2.1 Construction Materials	---	---	9.6 b/ (4.8)	20.1 (0.0)	29.7 (4.8)
2.2 Equipment	3.5 (3.2)	1.0 (0.9)	0.9 b/ (0.8)	---	5.4 (4.9)
2.3 Instructional Materials	---	---	1.2 b/ (1.0)	---	1.2 (1.0)
2.4 Vehicles	10.9 (10.9)	---	---	---	10.9 (10.9)
2.5 Equipment for Op.Rsrch.	2.0 (2.0)	---	1.0 c/ (1.0)	---	3.0 (3.0)
2.6 Vehicles for Op.Rsrch.	---	0.5 (0.5)	---	---	0.5 (0.5)
<b>3. Chemicals</b>					
3.1 Drugs		---	9.1 d/ (9.1)	---	9.1 (9.1)
3.2 Pesticides	25.6 e/ (25.6)	---	---	---	25.6 (25.6)
<b>4. Consultancies</b>					
4.1 Technical Assistance	---	---	3.5 f/ (3.5)	---	3.5 (3.5)
4.2 Operational Research	---	---	6.8 f/ (6.8)	---	6.8 (6.8)
4.3 Training	---	---	3.4 g/ (3.4)	---	3.4 (3.4)
4.4 Project Management	---	---	2.3 h/ (2.3)	---	2.3 (2.3)
<b>5. Miscellaneous</b>					
5.1 Supervision	---	---	11.5 i/ (6.0)	---	11.5 (6.0)
5.2 Maintenance	---	---	5.5 i/ (2.9)	---	5.5 (2.9)
5.3 Operating Costs	---	---	---	51.2 (0.0)	51.2 (0.0)
<b>TOTAL</b>	<b>39.0</b> (35.2)	<b>11.6</b> (6.4)	<b>66.1</b> (52.4)	<b>71.3</b> (0.0)	<b>188.0</b> (94.0)

See footnotes on next page.

**D. Disbursements**

5.17 The proposed Bank loan of US\$94.0 million would be disbursed over a period of about six years (Table 5.5), based on the implementation schedule and a combination of relevant standard IBRD disbursement profiles for PHN projects in the LAC region. The disbursement profile reflects the fact that works, equipment and vehicles would be procured in the early stages of project implementation and that construction materials, drugs and pesticides would be procured throughout project implementation. The Project Completion Date will be December 31, 1997 and the Project Closing Date will be June 30, 1998.

**Table 5.5: DISBURSEMENT FORECAST**

<u>IBRD Fiscal Year and Semester</u>	<u>Disbursements</u>			
	<u>Cumulative</u>	<u>\$</u>	<u>Semester</u>	
1993				
2nd (Jan 93-Jun 93)	6.0	6.0	7.0	2
1994				
1st (Jul 93-Dec 93)	7.5	13.5	14.0	3
2nd (Jan 94-Jun 94)	10.5	24.0	26.0	4
1995				
1st (Jul 94-Dec 94)	10.0	34.0	36.0	5
2nd (Jan 95-Jun 95)	10.0	44.0	47.0	6
1996				
1st (Jul 95-Dec 95)	10.0	54.0	57.0	7
2nd (Jan 96-Jun 96)	9.0	63.0	67.0	8
1997				
1st (Jul 96-Dec 96)	9.0	72.0	77.0	9
2nd (Jan 97-Jun 97)	8.0	80.0	85.0	10
1998				
1st (Jul 97-Dec 97)	7.5	87.5	93.0	11
2nd (Jan 98-Jun 98)	6.5	94.0	100.0	12

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Closing Date: June 30, 1998

Notes to Table 5.4: Totals represent total estimated costs per category including price and physical contingencies. Numbers between brackets reflect Bank financing. N.B.F.: Not Bank-Financed. Op. Rsrch.: Operational Research

a/ force account;

b/ local shopping on the basis of quotations from at least three suppliers or contractors;

c/ international shopping on the basis of quotations from at least three suppliers from at least two countries, up to US\$0.9 million; local shopping per b/, up to US\$0.1 million.;

d/ limited international bidding, up to US\$8.0 million; direct purchase, up to US\$1.1 million;

e/ ICB with prequalification, acceptable to the Bank;

f/ contracting of consultants, studies and auditors in accordance with Bank guidelines (August 1981);

g/ reimbursement of expenditures for training including travel and per diems;

h/ reimbursement of project managers and technicians under fixed-term contracts;

i/ reimbursement of expenditures on a declining basis.

5.18 The proceeds of the IBRD loan will be disbursed as follows:

- Civil works: buildings, 50% of total expenditures, renovation of laboratories, 100% of total expenditures;
- Goods (excluding construction materials, vehicles and chemicals), 100% of C.I.F. cost of foreign expenditures; 100% of ex-factory costs of locally manufactured goods; and 90% of local expenditure for other items procured locally;
- Construction materials (excluding construction materials for rural housing improvements), 50% of total expenditures;
- Vehicles, 100% of C.I.F. cost of foreign expenditures; 100% of ex-factory costs of locally manufactured goods; and 90% of local expenditures;
- Chemicals (Drugs and Pesticides), 100% of C.I.F. cost of foreign expenditures; 100% of ex-factory costs of locally manufactured goods; and 90% of local expenditures;
- Consultants' services (operational research, technical assistance training and project management), 100% of total expenditures; and
- Supervision and maintenance, 60% until the amount disbursed under this category shall have reached the aggregate of US\$6.0 million and 40% thereafter.

5.19 Documentation of Expenditures. Withdrawal applications for the following would be supported by full documentation: (a) works with a contract value of US\$500,000 or more; (b) goods with a contract value of US\$200,000 or more; (c) the first two contracts each project year for goods procured under LCB with a contract value of US\$100,000 or more; (d) vehicles and pesticides regardless of value; (e) drugs with a contract value of US\$100,000 or more; (f) consultants' services with a contract value of US\$25,000 or more; and (g) all research projects. Contracts valued at below the aforementioned limits and other disbursements against activities not undertaken by contract would be made on the basis of Statements of Expenditure (SOE), for which supporting documents would be maintained by DGSSSA and IB and would be made available for Bank staff review. Selective review of SOE documentation, covering at least 20% of contracts disbursed under these procedures, would be undertaken by visiting Bank missions.

5.20 As conditions of disbursement: (i) no withdrawals shall be made for expenditures under the project unless the expenditures are included in an annual action plan approved by the Bank; (ii) no withdrawals shall be made for expenditures for pesticides unless they are included in an agreed pesticide list; and (iii) no withdrawals shall be made for expenditures for drugs unless a procurement services agreement, acceptable to the Bank, has been signed with a procurement agent (para. 7.2).

#### E. Accounts and Audits

5.21 A Special Account in US dollars would be opened at the Central Bank, with an initial deposit of US\$6.0 million equivalent. In addition, the executing agencies of MSAS (DGSSSA and IB) will keep separate project accounts

for project expenditures in accordance with internationally accepted accounting procedures. The accounts would show expenditures for each project component, subdivided by expenditures financed by the Bank and the GOV.

5.22 All project accounts, the Special Account and all disbursements against SOEs would be audited annually by an independent auditor acceptable to the Bank in accordance with the Bank's auditing guidelines. The executing agencies would submit to the Bank the audit reports of expenditures within six months of the closure of each fiscal year. The audit reports would certify that funds were used for the purposes for which they were provided. Assurances were obtained at negotiations that the executing agencies will follow Bank rules in auditing of project accounts and procurement and submit audits within six months of the end of each fiscal year (para. 7.2c).

## VI. PROJECT BENEFITS AND RISKS

### A. Environmental Impact

6.1 Although the project will use DDT and other pesticides for vector control operations, no negative environmental impact is foreseen. The Bank supports the banning of DDT for agricultural use. However, DDT remains the pesticide of choice recommended by the World Health Organization for malaria control. In public health campaigns, DDT is sprayed only on interior walls of houses and only where the mosquito vector has shown no resistance to it. Used in this way, no serious impact on surrounding flora and fauna has been observed. Under the project, DDT will not be used for fogging or aerial spraying. Other pesticides such as pyrethroids, which are commonly used in agriculture, will be used when chemical measures are applied out of doors. Malaria transmission in Venezuela, and thus the use of DDT for its control, is largely concentrated in a few focal areas, specifically, gold and diamond mining camps, new agricultural settlements, and some urban peripheries. Venezuela, and other countries, are nonetheless exploring alternative pesticides for use in these indispensable public health campaigns.

6.2 Procedures to assure the safe management of pesticides, including regular testing of spraymen, have long been in place as an integral part of DGSSSA disease control programs. The project will further strengthen DGSSSA efforts to provide adequate environmental and worker safeguards through the support of continuous training of spraymen in the appropriate and safe use of pesticides. Assurances were obtained at negotiations that the Government will follow standards and procedures for the selection and use of pesticides under the project which are consistent with WHO standards and procedures and, taking into account the results of comprehensive studies, discuss and agree with the Bank on any changes in such standards and procedures (para. 7.1f).

### B. Project Benefits

6.3 The principal beneficiaries of this project will be low income populations in rural and peri-urban areas throughout Venezuela where endemic diseases are an important cause of morbidity and the threat of their further spread is high. These populations will benefit directly through decreased risk of disease and improved health status, and indirectly through improved productivity. Reducing malaria, in particular, has a positive economic impact in agricultural areas where peak malaria transmission tends to coincide with peak labor demand. In addition, school-age children will benefit from reduced incidence of intestinal parasites which can have an important impact on learning. The benefits of controlling diseases which have the potential for rapid dispersion, especially malaria, dengue and cholera, are especially great (the externalities are high). Early intervention to halt major epidemics is much less costly than attempting to reduce disease transmission that is already widespread. The impact of the project will be gender neutral. In addition, the institutions responsible for endemic disease control will benefit from improved management and technical capacity. In particular, the project will help the IB and DGSSSA to improve the design and evaluation of control strategies and the cost-effectiveness of disease control interventions. Finally, the project will begin to reverse the decline in

endemic disease control financing as part of a wider commitment by the Government to support a shift in spending away from curative, hospital-based care and towards preventive health actions.

### C. Risks

6.4 Labor strikes due to delays in payment of MSAS field workers pose a significant risk to project implementation. In 1990 and 1991, DGSSSA operations were seriously impaired by such strikes. Successful and sustainable disease control depends on the timely and consistent application of appropriate control measures; work stoppages reduce the impact of control programs and have particularly affected malaria control. MSAS officials view the problem as a consequence of insufficient control over existing funds for payment of workers (under the "Laborers' Collective Contract"). The situation would likely improve if the executing agencies had greater control of the resources budgeted for the Laborers' Collective Contract. Assurances were obtained at negotiations that the Government will maintain a mechanism, satisfactory to the Bank, providing for the management by DGSSSA of all funds for payment of DGSSSA's field workers (para. 7.1j).

6.5 There are also risks of delays in project implementation due to the Borrower's lack of experience with Bank-financed projects. The project launch seminar is therefore of special importance to adequately prepare all of the institutions involved with regard to Bank procedures.

6.6 The sustainability of adequate financing for endemic disease control programs beyond the life of the project is also a concern, given the fact that these important programs have suffered a serious decline in financing over the last decade. However, the Government clearly recognizes that this project helps to bring severely underfinanced programs back to an adequate level of funding and that adequate levels of funding must be maintained in order to maintain gains achieved. The Government also recognizes that maintaining adequate spending on endemic disease control is part of an important and necessary shift in resource allocation in the health sector away from curative care and towards more cost-effective preventive health actions. In addition, project sustainability is strengthened by the fact that more than 85% of incremental recurrent costs will be financed by the Government. Also, the number of new personnel supported by the project is small and, with the exception of project management, salaries will be financed entirely out of counterpart funds (furthermore, hiring of new personnel is thinly spread among the 28 states, each of which will create three or four new positions to support expanded IB programs). Lastly, the future costs of disease control will decline to the extent that: (i) the project investments successfully reduce disease transmission; and (ii) the project helps develop more cost-effective interventions through improved understanding of disease situations and strategic options.

**VII. AGREEMENTS REACHED AND RECOMMENDATION****Agreements Reached**

- 7.1 At negotiations, assurances were obtained that the Borrower will:
- (a) by March 1 of each year (i) submit a report to the Bank, for its review and comments, on progress in implementation of all project components and any proposals for adjustments in project implementation; and (ii) submit to the Bank, for its review and approval, a proposed annual investment program providing for the activities, implementation schedule and targets, and proposed project budget for the then upcoming year, based on the implementation schedule in Annex 5 (para. 4.37);
  - (b) participate in annual reviews (by March 30 of each year), jointly with the Bank, focusing on: (i) evaluation of progress in project execution and achievement of project objectives, based on the implementation schedule and agreed monitoring indicators (see Annexes 5 and 6); (ii) review of proposed annual budgets for the project and for endemic disease control programs for the subsequent year; (iii) any changes in project design and implementation that may be necessary (including the possible effects of decentralization in the health sector); and (iv) the mechanism providing for the management by DGSSSA of all funds for payment of DGSSSA's field workers. Upon the Bank's recommendation, any required adjustments would be made in project implementation in order to attain the agreed objectives (para. 4.35);
  - (c) follow Bank rules in auditing of project accounts and procurement and submit audits within six months of the end of each fiscal year (para. 5.22);
  - (d) implement the operational research subcomponent in accordance with the Operational Research Regulations (para. 4.36);
  - (e) maintain the Project Implementation Units, Project Steering Committee, Procurement Committee and Research Steering Committee throughout the execution of the project (para. 4.34);
  - (f) follow standards and procedures for the selection and use of pesticides under the project which are consistent with WHO standards and procedures and, taking into account the results of comprehensive studies, discuss and agree with the Bank on any changes in such standards and procedures (para. 6.2);
  - (g) through the DGSSSA: (i) carry out a management study, not later than March 31, 1993, to review the organization and management structure of DGSSSA and make recommendations to improve such structure; (ii) not later than June 30, 1993, based on the management study and the Bank's comments thereon, present an action plan, satisfactory to the

Bank; and (iii) thereafter implement such action plan in a manner under a timetable satisfactory to the Bank (para 4.23);

- (h) carry out studies, not later than March 1, 1993, to develop appropriate indicators of the impact of institutional development activities supported under the project (paras. 4.23 and 4.30);
- (i) in respect of endemic disease control programs: (i) during the last quarter of each fiscal year, exchange views with the Bank, through the executing agencies, on budgetary needs; (ii) in each fiscal year furnish evidence satisfactory to the Bank showing that the final proposed MSAS budget includes adequate allocations in the opinion of the Bank, not later than 15 days after the Ministry of Finance has received the respective final proposed budget of MSAS; (iii) not later than May 31 in each fiscal year, furnish evidence satisfactory to the Bank of the final proposed budget for endemic disease control programs for the then following fiscal year, submitted by the Borrower's Executive Branch to the Borrower's Congress; and (iv) not later than March 1 in each fiscal year, furnish evidence satisfactory to the Bank showing the amount of expenditures incurred for endemic disease control programs in the then previous fiscal year (para. 4.38); and
- (j) maintain a mechanism, satisfactory to the Bank, providing for the management by DGSSSA of all funds for payment of DGSSSA's field workers (para 6.4).

7.2 As conditions of disbursement: (i) no withdrawals shall be made for expenditures under the project unless the expenditures are included in an annual action plan approved by the Bank; (ii) no withdrawals shall be made for expenditures for pesticides unless they are included in an agreed pesticide list; and (iii) no withdrawals shall be made for expenditures for drugs unless a procurement services agreement, acceptable to the Bank, has been signed with a procurement agent (para. 5.20).

#### Recommendation

7.3 Subject to the above conditions, the proposed project would constitute a suitable basis for a Bank loan of US\$94.0 million equivalent to the Government of Venezuela, repayable in 15 years, including a five-year grace period, at the Bank's standard variable interest rate.

Venezuela  
Endemic Disease Control Project  
B58

Project Components by Year

	Base Costs					Total	
	1993	1994	1995	1996	1997	B58	US\$
<b>A. Disease Control</b>							
1. Malaria Control	642853.2	410253.2	410253.2	410253.2	410253.2	2283866.0	33986.1
2. Dengue Control	389565.2	190845.2	190455.2	190455.2	190455.2	1151776.0	17139.5
3. Chagas Control	89536.2	41734.2	41344.2	41344.2	41344.2	255303.6	3799.2
4. MIVICA Rural House Improv	253004.0	249012.0	249012.0	249012.0	249012.0	1249852.0	18587.1
5. Schistosomiasis Control	64273.7	44713.7	44115.7	43516.7	42990.3	239610.1	3565.6
6. Intestinal Parasites	100908.0	65440.0	65440.0	65440.0	65440.0	362668.0	5396.8
7. Yellow Fever	38993.2	28977.2	28977.2	28977.2	28977.2	154902.0	2305.1
8. Cholera	225370.8	108161.2	108161.2	108161.2	108161.2	658015.7	9791.9
9. Other Metaxenic Diseases	24533.6	9861.6	9861.6	9861.6	9861.6	63980.0	952.1
10. Leishmaniasis Control	41855.6	28175.6	28175.6	45307.2	31627.2	175141.2	2606.3
11. Leprosy Control	78547.0	22894.2	22894.2	30946.2	16018.2	171299.9	2549.1
12. Onchocerciasis Control	40559.9	23373.2	23373.2	42662.0	28022.0	157990.3	2351.0
13. Leish/Oncho Entomology	5345.0	2744.7	2744.7	5604.7	3108.7	19548.0	290.9
14. IB-Info, Educ, Comm.	46827.8	37797.9	37797.9	43432.7	38488.7	204345.2	3040.9
15. DGSSSA - Info, Educ, Comm.	71936.4	30168.4	30168.4	30168.4	30168.4	192610.0	2866.2
<b>Sub-total</b>	<b>2114109.6</b>	<b>1294152.4</b>	<b>1292774.4</b>	<b>1345142.6</b>	<b>1293928.3</b>	<b>7340107.3</b>	<b>109227.8</b>
<b>B. Institutional Development</b>							
1. DGSSSA - Training	91277.0	53223.0	53223.0	53223.0	53223.0	304169.0	4526.3
2. DGSSSA- Str.Mgmt.	14700.0	14700.0	14700.0	14700.0	14700.0	73500.0	1093.7
3. DGSSSA Information System	120284.2	11512.0	11512.0	11512.0	11512.0	166332.2	2475.2
4. DGSSSA Operation Research	73330.1	73330.1	73330.1	73330.1	73330.1	366650.5	5456.1
5. DGSSSA Infrastructure	445630.6	477172.2	489850.6	119050.0	119050.0	1650753.4	24564.8
6. IB-Training	15070.0	11870.0	6938.0	1098.0	1098.0	36074.0	536.8
7. IB- Strengthening Mgmt.	7996.0	7996.0	7996.0	7996.0	7996.0	39980.0	594.9
8. IB-Operational Research	46000.1	46000.1	46000.1	46000.1	46000.1	230000.4	3422.6
9. IB-Infrastructure	28472.0	4403.2	596.8	596.8	596.8	34665.6	515.9
10. IB-Information Systems	42275.0	36810.3	29310.3	29310.3	29310.3	167016.0	2485.4
<b>Sub-total</b>	<b>885034.9</b>	<b>737016.8</b>	<b>733456.8</b>	<b>356816.2</b>	<b>356816.2</b>	<b>3069141.1</b>	<b>45671.7</b>
<b>Total BASELINE COSTS</b>	<b>2999144.5</b>	<b>2031169.3</b>	<b>2026231.3</b>	<b>1701958.9</b>	<b>1650744.6</b>	<b>10409248.5</b>	<b>154899.5</b>
Physical Contingencies	87447.1	72555.0	72863.2	55551.5	55630.8	344047.6	5119.8
Price Contingencies	395276.7	666918.7	1065500.1	1226741.5	1578047.6	4932484.7	27986.9
<b>Total PROJECT COSTS</b>	<b>3481868.3</b>	<b>2770642.9</b>	<b>3164594.5</b>	<b>2984251.9</b>	<b>3284423.0</b>	<b>15685780.7</b>	<b>188006.1</b>
Taxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign Exchange	2035323.6	1155256.0	1264828.2	1207436.2	1250122.1	6912966.1	83890.1

Values Scaled by 1000.0 6/17/1992 15:17

**Venezuela**  
**Endemic Disease Control Project**  
**Projects Components by Year**

Totals Including Contingencies  
 US\$

	1993	1994	1995	1996	1997	Total
<b>A. Disease Control</b>						
1. Malaria Control	10065.2	6981.1	7367.0	7779.0	8195.2	40407.5
2. Dengue Control	5989.2	3293.0	3569.1	3831.3	4114.3	20796.9
3. Chagas Control	1385.0	709.1	745.2	786.1	829.6	4454.9
4. NIVICA Rural House Improv	3984.7	4402.4	4781.8	5133.7	5513.4	23816.0
5. Schistosomiasis Control	1004.2	767.3	807.2	843.9	884.4	4307.1
6. Intestinal Parasites	1576.3	1129.4	1207.7	1281.9	1361.3	6556.6
7. Yellow fever	607.8	493.7	525.3	555.5	587.7	2769.8
8. Cholera	3493.7	1916.2	2095.9	2261.5	2440.7	12208.0
9. Other Metaxenic Diseases	383.3	165.2	173.2	181.1	189.5	1092.3
10. Leishmaniasis Control	643.8	485.6	524.7	870.3	678.9	3203.3
11. Leprosy Control	1226.2	404.4	442.4	587.9	355.9	3016.7
12. Onchocerciasis Control	619.5	405.8	443.8	829.7	622.2	2921.0
13. Leish/Oncho Entomology	82.7	49.4	54.1	109.2	71.4	366.9
14. IB-Info, Educ, Comm.	716.3	654.0	714.8	870.6	846.9	3802.6
15. DGSSSA - Info, Educ, Comm.	1106.6	526.3	573.8	617.7	665.1	3489.4
<b>Sub-Total</b>	<b>32884.4</b>	<b>22383.0</b>	<b>24046.0</b>	<b>26539.5</b>	<b>27356.2</b>	<b>133209.1</b>
<b>B. Institutional Development</b>						
1. DGSSSA - Training	1394.7	902.4	975.8	1044.2	1117.8	5434.9
2. DGSSSA- Str.Mgmt.	222.4	246.7	266.4	284.7	304.4	1324.6
3. DGSSSA Information System	1909.7	195.6	210.3	224.0	238.8	2778.3
4. DGSSSA Operation Research	1109.9	1216.9	1304.9	1387.8	1476.7	6496.2
5. DGSSSA Infrastructure	7056.3	8366.9	9270.1	2440.6	2614.8	29748.0
6. IB-Training	228.7	195.1	119.9	20.9	22.2	586.8
7. IB- Strengthening Mgmt.	121.2	137.9	150.9	162.9	175.9	748.8
8. IB-Operational Research	696.3	763.4	818.5	870.6	926.3	4075.1
9. IB-Infrastructure	449.9	77.2	11.1	11.8	12.5	562.6
10. IB-Information Systems	663.1	630.7	544.8	581.8	621.5	3041.8
<b>Sub-Total</b>	<b>13852.1</b>	<b>12732.9</b>	<b>13672.6</b>	<b>7029.2</b>	<b>7510.2</b>	<b>54797.1</b>
<b>Total PROJECTS COSTS</b>	<b>46736.5</b>	<b>35115.9</b>	<b>37718.6</b>	<b>33568.6</b>	<b>34866.5</b>	<b>188006.1</b>

Values Scaled by 1000.0 6/17/1997 15:17

Venezuela  
Endemic Disease Control Project  
Summary Accounts by Year

Totals Including Contingencies  
US\$

	1993	1994	1995	1996	1997	Total
<b>I. INVESTMENT COSTS</b>						
A. Civil Works	5414.1	6058.0	6660.3	0.0	0.0	18132.4
B. Construct.Mater.Outhouses	1587.9	1775.7	1925.3	2064.3	2214.2	9567.4
C. NIVICA Construc.Materials	3334.5	3728.9	4043.1	4335.1	4649.9	20091.5
D. Equipment	5210.7	205.1	0.0	0.0	0.0	5415.8
E. Vehicles	9996.2	0.0	0.0	917.6	0.0	10913.7
F. Drugs	1682.5	1751.4	1815.3	1873.6	1935.0	9057.7
G. Pesticides	4737.5	4922.3	5111.7	5306.0	5507.6	25585.0
H. Technical Assistance	850.8	830.4	869.6	451.7	480.7	3483.3
I. Operational Research	1806.2	1980.3	2123.4	2258.4	2403.0	10571.3
J. Training	751.9	715.1	677.7	614.3	653.7	3412.7
K. Instructional Materials	199.7	224.3	243.7	261.7	281.2	1210.6
L. Project Management	375.0	428.4	470.0	508.1	549.5	2330.9
<b>Total INVESTMENT COSTS</b>	<b>35946.8</b>	<b>22619.8</b>	<b>23940.0</b>	<b>18590.7</b>	<b>18676.8</b>	<b>119772.2</b>
<b>II. RECURRENT COSTS</b>						
A. Supervision	1859.3	2124.2	2330.2	2519.5	2724.5	11557.7
B. Maintenance	124.9	1054.6	1255.5	1455.1	1590.6	5480.7
C. Operating Costs	8805.5	9317.2	10193.0	11003.3	11876.6	51195.5
<b>Total RECURRENT COSTS</b>	<b>10789.7</b>	<b>12496.0</b>	<b>13778.7</b>	<b>14977.9</b>	<b>16191.7</b>	<b>68234.0</b>
<b>Total PROJECT COSTS</b>	<b>46736.5</b>	<b>35115.9</b>	<b>37718.6</b>	<b>33568.6</b>	<b>34866.5</b>	<b>188006.1</b>

Values Scaled by 1000.0 6/17/1992 15:17

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**  
**FINANCING PLAN BY YEAR**

Total Including Contingencies  
US\$ millions

	1993	1994	1995	1996	1997	TOTAL
<b>INVESTMENT COSTS</b>						
IBRD	28.5	14.9	15.6	13.2	12.9	85.1
GOVERNMENT	7.4	7.7	8.4	5.4	5.8	34.7
<b>TOTAL</b>	<b>35.9</b>	<b>22.6</b>	<b>24.0</b>	<b>18.6</b>	<b>18.7</b>	<b>119.8</b>
<b>RECURRENT COSTS</b>						
IBRD	1.2	1.9	2.2	1.9	1.7	8.9
GOVERNMENT	9.6	10.6	11.6	13.0	14.5	59.3
<b>TOTAL</b>	<b>10.8</b>	<b>12.5</b>	<b>13.8</b>	<b>14.9</b>	<b>16.2</b>	<b>68.2</b>
<b>TOTAL PROJECT COSTS</b>						
IBRD	29.7	16.8	17.8	15.1	14.6	94.0
GOVERNMENT	17.0	18.3	20.0	18.4	20.3	94.0
<b>TOTAL</b>	<b>46.7</b>	<b>35.1</b>	<b>37.8</b>	<b>33.5</b>	<b>34.9</b>	<b>188.0</b>

Note: The Inflation rates used in the calculation of project costs were: 1992 - 67.2; 1993 - 74.5; 1994 - 78.9; 1995 - 83.9; 1996 - 88.9; 1997 - 94.2; 1998 - 99.8.

The Financing Plan for 1993 - 1998 which was included in the text of the Public Credit Law was as follows:

	1993	1994	1995	1996	1997	1998	Total
World Bank	28	16	16	14	13	7	94
Government	16	17	18	18	18	7	94
<b>Total</b>	<b>44</b>	<b>33</b>	<b>34</b>	<b>32</b>	<b>31</b>	<b>14</b>	<b>188</b>

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**

**DISBURSEMENT CATEGORIES AND PERCENTAGES**  
(US\$ millions)

<u>Category</u>	<u>Amount</u>	<u>Disbursement Percentage</u>
1. Civil Works	8.3	
(a) Laboratory Renovation for operational research	0.3	100% of total expenditures
(b) Other civil works	8.0	50% of total expenditures
2. Goods	8.5	100% of C.I.F. cost of foreign expenditures; 100% of ex-fact costs of locally manufactured goods; and 90% of local expenditures for other items procured locally
(a) Goods for operational research	2.8	
(b) Other goods	5.7	
3. Construction Materials	4.5	50% of total expenditures
4. Vehicles	11.0	100% of C.I.F. cost of foreign expenditures; 100% of ex-factory costs of locally manufactured goods; and 90% of local expenditures
(a) Vehicles for operational research	0.4	
(b) Other vehicles	10.6	
5. Drugs and Pesticides	32.0	100% of C.I.F. cost of foreign expenditures; 100% of ex-fact costs of locally manufactured goods; and 90% of local expenditures
6. Consultants' Services	14.5	100% of total expenditures
(a) Operational research	6.5	
(b) Other technical assistance including training and services under the Procurement Services Agreement	8.0	

<u>Category</u>	<u>Amount</u>	<u>Disbursement Percentage</u>
7. Supervision and Maintenance	8.2	60% until the amount of the loan proceeds disbursed under this category shall have reached the aggregate of US\$6.0 million and 40% thereafter.
8. Unallocated	7.0	
<hr/>		
Total	94.0	

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**  
**PROCUREMENT METHODS AND PRIOR REVIEW THRESHOLDS**  
**(US\$ '000)**

<b>CATEGORY</b>	<b>TYPE OF PROCUREMENT</b>	<b>PRIOR REVIEW THRESHOLD</b>	<b>CONTRACT VALUE</b>	<b>AGGREGATE LIMIT</b>
Civil Works	ICB	>500	>3000	N.A.
	LCB	>500	<3000	10100
	Force Account	N.A.	<100	1000
	Local Shopping	N.A.	< 25	300 a/
Goods	ICB	>200	>200	N.A.
	LCB	>100	<200	1500 b/
	Local Shopping	N.A.	< 25	11800 c/
	International Shopping	N.A.	<200	900 d/
Drugs	LIB	>100	>200	8000
	Direct Purchase	>100	N.A.	1100
Pesticides	ICB e/	>200	>200	N.A.
Consultants' Services	---	> 25	> 25	N.A.

N.A.: Not applicable.

a/Renovation of facilities under operational research component.

b/Includes US\$500,000 for vehicles under operational research component.

c/Includes US\$100,000 for basic equipment under operational research component.

d/Laboratory equipment under operational research component.

e/ICB with prequalification.

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**

**IMPLEMENTATION SCHEDULE**  
**DGSSSA Disease Control Component (Part A.1 - A.4)**

**Annual Targets (000's)**

Activity	1993	1994	1995	1996	1997	Total
<b><u>MALARIA (Part A.1)</u></b>						
Houses to visit	2900.0	2755.0	2617.2	2486.3	2362.0	13120.7
Houses to spray	650.0	618.0	587.0	558.0	530.0	2943.0
Houses to fog	3600.0	2850.0	2710.0	2575.0	2450.0	13585.0
Malaria treatments to positive cases	30.0	24.0	19.0	15.0	12.0	100.0
Preventive malaria treatments	120.0	96.0	77.0	61.0	49.0	403.0
Blood slides examined	270.0	300.0	285.0	270.0	257.0	1382.0
<b><u>DENGUE (Part A.2)</u></b>						
Houses to visit	160.0	130.0	125.0	120.0	120.0	655.0
Houses to spray	800.0	750.0	720.0	715.0	715.0	3700.0
Houses to fog	1500.0	1250.0	1200.0	1150.0	1100.0	6200.0
<b><u>CHAGAS (Part A.3)</u></b>						
House to visit	132.0	130.0	125.0	120.0	115.0	622.0
Houses to spray	35.4	33.6	31.9	30.3	28.8	160.1
<b><u>SCHISTOSOMIASIS (Part A.4)</u></b>						
Schistosomiasis treatments	1.0	1.5	2.0	2.5	3.0	10.0
Inspections of water courses (meters)	10000.0	12000.0	13000.0	14000.0	15000.0	64000.0
Mollusciciding (meters)	1000.0	900.0	800.0	750.0	700.0	4150.0
Charlas Sanitarias	2.5	2.8	3.1	3.5	4.0	15.9

VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT

IMPLEMENTATION SCHEDULE  
DGSSSA Disease Control Component (Part A.5 - A.8 and A.12b)

Annual Targets (000's)

Activity	1993	1994	1995	1996	1997	Total
<b><u>INTESTINAL PARASITES (Part A.5)</u></b>						
Houses to visit	120.0	120.0	120.0	120.0	120.0	600.0
Latrines to build	10.0	10.0	10.0	10.0	10.0	50.0
Latrine inspections	36.1	36.1	36.1	36.1	36.1	180.5
Charlas Sanitarias	11.2	11.2	11.2	11.2	11.2	56.0
Anthelmintic treatments	5000.0	5000.0	5000.0	5000.0	5000.0	25000.0
<b><u>YELLOW FEVER AND OTHER DISEASES (Part A.6 and A.8)</u></b>						
Houses to spray	35.0	40.0	32.0	30.0	25.0	162.0
Houses to fog	900.0	910.0	900.0	900.0	950.0	4610.0
Yellow Fever Vaccines to administer	800.0	800.0	800.0	800.0	800.0	4000.0
<b><u>CHOLERA (Part A.7)</u></b>						
Aqueduct inspections	29.0	29.0	29.0	29.0	29.0	145.0
Residual water treatment inspections	1.9	1.9	1.9	1.9	1.9	9.5
Solid waste inspections and disposal	1.4	1.4	1.4	1.4	1.4	7.0
Recreational water inspections	2.5	2.5	2.5	2.5	2.5	12.5
Chemical-Bacteriological examinations	4.5	4.5	4.5	4.5	4.5	22.5
Chlorine treatments (kgs)	135.0	135.0	135.0	135.0	135.0	675.0
<b><u>DGSSSA Information, Education, Communication (Part A.12a)</u></b>						
Household visits made	50.0	60.0	72.0	86.4	103.0	372.0
Community meetings held	1.0	1.2	1.4	1.7	2.0	7.4
County meetings held	1.0	.9	.8	.7	.6	4.0
Speeches given	1.3	1.5	1.9	2.2	2.7	9.8
Movies shown	1.4	1.6	2.0	2.4	2.9	10.4

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**

**IMPLEMENTATION SCHEDULE**  
**IB Disease Control Component (Parts A.9, A.10, and A.12b)**

**Annual Targets**

Activity	1993	1994	1995	1996	1997	Total
<b><u>LEPROSY (Part A.9)</u></b>						
Multidrug Treatments a/ Supervision Visits	704	1196	912	812	827	4411
central to regional	46	46	46	46	46	230
regional to local	64	82	70	84	66	366
<b><u>LEISHMANIASIS (Part A.10)</u></b>						
Glucantime Treatments	520	480	420	400	400	2220
Anfotericin B Treatments	50	50	40	40	35	215
Immunotherapy Treatments	4500	4500	4500	4500	4500	22500
Supervision Visits						
central to regional	46	46	46	46	46	230
regional to local	64	82	70	84	66	366
<b><u>ONCHOCERCIASIS (Part A.11)</u></b>						
Visits to villages b/ Diagnostic Tests	752	1652	1652	1652	1652	7300
Ivermectin Treatments	16000	16000	1600	1600	1600	36800
	20300	31200	31200	31200	31200	145000
<b><u>IB INFORMATION, EDUCATION, COMMUNICATIONS (IEC) (Part A.12b)</u></b>						
<b>Specialists to Hire:c/</b>						
Sociologists	4					6
Social Promoters	60					
Educators	2					
<b>Supervision Visits:</b>						
central to regional	40	40	40	40	40	200
regional to local	100	100	100	100	100	500

a/ Multidrug treatment (MDT) is a two-year drug therapy course; the expected number of new patients to begin MDT in each project year is: 704 in 1993, 492 in 1994, 420 in 1995, 392 in 1996, and 435 in 1997.

b/ A total of 1,652 villages will be visited and surveyed. Village visits, diagnostic testing through skin-snips, and ivermectin treatment will begin in 1993 in the states of Sucre, Anzoategui and Monagas. The same activities will begin in 1994 in the states of Aragua, Cojedes, Guarico, Carabobo, Falcon and Yaracuy. Ivermectin treatments must be administered yearly for a period of about 12 to 14 years.

c/ These are expected to be hired on a permanent basis during the first year of the project and will be paid out of counterpart project funds.

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**

**IMPLEMENTATION SCHEDULE**  
**Institutional Development Component**  
**DGSSSA and IB Training Subcomponents (Part B.1a and B.2a)**

**Annual Targets**

Activity	1993	1994	1995	1996	1997	Total
<b><u>DGSSSA Training (Part B.1a)</u></b>						
Management Training (number of students)	3	3	3	3	0	12
Foreign Fellowships (number of students)	2	2	2	2	0	8
Domestic Fellowships (number of students)	4	4	4	4	4	20
Entomology Course (number of courses)	1	1	1	1	1	5
Consultants to hire (months)	2	2	2	2	2	10
<b><u>DGSSSA In-Service Training (Part B.1a)</u></b>						
Continuing Education (number of courses)	35	35	35	35	35	175
Professional Specialization (number of courses)	2	2	2	2	2	10
Masters Level (number of courses)	2	2	2	2	2	10
Technical Specialization (number of courses)	3	3	3	3	3	15
Actualization Courses (number of courses)	20	20	20	20	20	100
<b><u>IB Training (Part B.2a)</u></b>						
Physicians' Course (student months)	33	33				66
Health Auxiliary Course (student months)	600	400	200			1200
Health Promoter Course (student months)	100	100				200
Foreign Fellowships (number of students)	1	1	1			3

VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT

IMPLEMENTATION SCHEDULE  
Institutional Development Component  
DGSSSA and IB Information Systems Subcomponents (Part B.1c and B.2b)

Annual Targets

Activity	1993	1994	1995	1996	1997	Total
<u>DGSSSA</u>						
<u>Information Systems</u>						
<u>(Part B.1c)</u>						
DGSSSA Information Systems Training (number of courses)						
	20	20	20	20	20	100
DGSSSA Info Systems Consultants to hire (consultant months)*						
	8	8	8	8	8	40
DGSSSA Purchase and installation of equipment (% completed)						
	100%					100%
<u>IB Information Systems (Part B.2b)</u>						
IB Information Systems Training (number of students)						
	30	30	30	30	30	150
IB Info Systems Consultants to hire (consultant months)*						
	4	4	4	4	4	20
IB Purchase and installation of equipment (% completed)						
	50%	100%				100%

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\*based on approximate cost of US\$10,000 per consultant month.

VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT

IMPLEMENTATION SCHEDULE  
Institutional Development Component  
DGSSSA and IB Administration and Management Subcomponents (Part B.1b and B.2c)

Activity	<u>Annual Targets</u>					Total
	1993	1994	1995	1996	1997	
<u>DGSSSA Administration and Management (Part B.1b)</u>						
DGSSSA Management Study (% completed)	100%					100%
DGSSSA Plan to Implement Management Study Recommendations (% completed)	100%					100%
DGSSSA Management Consultants to hire (consultant months)	14	14	14	14	14	70
<u>IB Administration and Management (Part B.2c)</u>						
IB Management Course* for Central Level Managers (number of students)	2	2	2	2	2	10
IB Management Course for Regional Level Managers (number of students)	5	5	5	5	5	25

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**

**IMPLEMENTATION SCHEDULE**  
**Institutional Development Component**  
**DGSSSA and IB Infrastructure Subcomponents (Part B.1e and B.2e)**

**Annual Targets**

Activity	1993	1994	1995	1996	1997	Total
<b><u>DGSSSA Infrastructure (Part B.1e)</u></b>						
DGSSSA Central Headquarters in Maracay (% completed)	33%	66%	100%			100%
EMSA Research Center Expansion (% completed)	100%					100%
DGSSSA Information Systems Installations (% completed)	100%					100%
Latrines for Intestinal Parasite Control Program (see Part A.5) (number of latrines)	10000	10000	10000	10000	10000	50000
DGSSSA Regional Headquarters (number of headquarters)	3	3	3			9
DGSSSA Operational Bases (number of bases)	7	8	10			25
DGSSSA Field Training Bases (number of bases)	3					3
<b><u>IB Infrastructure (Part B2.e)</u></b>						
IB Operational Bases (number of bases)	26	15				41
IB Training Centers (number of centers)	5					5

**VENEZUELA**  
**ENDEMIC DISEASE CONTROL PROJECT**

**IMPLEMENTATION SCHEDULE**  
**YEARLY TARGETS BY CATEGORY OF EXPENDITURE**  
**(percent of costs in category)**

<b><u>CATEGORY</u></b>	<b><u>PROJECT YEAR AND TARGET</u></b>				
	<b><u>1993</u></b>	<b><u>1994</u></b>	<b><u>1995</u></b>	<b><u>1996</u></b>	<b><u>1997</u></b>
<b>Civil Works</b>	33	33	34	0	0
<b>Latrine Construction</b>	20	20	20	20	20
<b>Housing Improvements</b>	20	20	20	20	20
<b>Vehicles</b>	92	0	0	8	0
<b>Equipment</b>	96	4	0	0	0
<b>Drugs</b>	20	20	20	20	20
<b>Pesticides</b>	20	20	20	20	20
<b>Operational Research</b>	20	20	20	20	20
<b>Technical Assistance</b>	27	25	24	12	12
<b>Training</b>	25	22	19	17	17
<b>Instructional Materials</b>	20	20	20	20	20
<b>Project Management</b>	20	20	20	20	20

VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT

KEY PROJECT INDICATORS

1. Two sets of indicators will be used to monitor project implementation and assess project impact: monitoring or "intermediate output" indicators and final outcome indicators.

2. Monitoring (Intermediate Output) Indicators. The first set of indicators measure the physical execution of project activities. Specifically, they compare action taken against actions programmed or pre-determined targets. These monitoring indicators can be used for both the disease control component and the institutional strengthening component. Since they are inherent in the project implementation schedule, which specifies the targets for all project activities, they are not listed here in their entirety. Looking at any activity in the implementation schedule, the intermediate output indicator can be readily conceptualized as the ratio of what was actually undertaken in a given year over what target was set for the same year. A few examples are listed below:

Component A. Disease Control

- number of houses sprayed for malaria control over the target number of houses to be sprayed
- number of houses treated with pesticides for Aedes aegypti control over the number of houses programmed for treatment
- number of meters of water courses treated with molluscicide for schistosomiasis control over the number of meters of water courses programmed for treatment
- number of house visits for inspection (for the Chagas bug) and health education for Chagas control undertaken over the number of house visits programmed
- number of latrines constructed for intestinal parasite control over the number of latrine constructions programmed
- number of aqueduct inspections undertaken (for cholera control) over the number of aqueduct inspections programmed
- number of villages visited to undertake epidemiological surveillance and treatment/immunoprophylaxis activities for leprosy control over the number of villages programmed to be visited
- number of villages visited to undertake epidemiological surveillance and treatment/immunoprophylaxis activities for leishmaniasis control over the number of villages programmed to be visited
- number of villages visited to undertake epidemiological surveillance and treatment activities for onchocerciasis over number of villages programmed to be visited

**Component B. Institutional Strengthening**

- number of field bases completed over number of field bases programmed for construction
- number of regional headquarters completed over number of regional headquarters programmed for construction
- number of computer training courses completed over number of courses programmed
- number of fellowships granted (and in progress) over number of fellowships programmed
- number of in-service training courses completed over number of such courses programmed
- percentage of operational research funds utilized over percentage of funds programmed to be utilized
- percentage of technical assistance funds utilized over percentage of funds programmed to be utilized

3. **Final Outcome Indicators.** The second set of indicators measure the "final outcome" of the project in terms of impact on health and disease transmission. A few of these indicators are listed below. The disease situation described in Annex 7 will serve as a baseline for assessing improvement of the endemic disease situation over time.

**Component A. Disease Control**

- Malaria: number of new cases by municipality and state (incidence) and number of new cases per year per 1000 population (annual parasitic incidence)
- Dengue and Dengue Hemorrhagic Fever: number of new cases per year per thousand population (annual parasitic incidence) and number of new foci of transmission
- Chagas: total number of cases per thousand population (prevalence) and number of new cases diagnosed per year per thousand population (annual parasitic incidence)
- Schistosomiasis: number of new cases per year per thousand population (annual parasitic incidence) and number of new transmission foci discovered
- Intestinal Parasites: number of cases per thousand population (prevalence)
- Leishmaniasis (LTA): number of new cases of LTA per year per thousand population (annual parasitic incidence) and number of new transmission foci discovered
- Leprosy: number of cases of leprosy per 1000 population (prevalence) and number of new cases identified in a given year (incidence)
- Onchocerciasis: community microfilarial load (CMFL) which is a combined measure of the percentage of a community infected and the overall intensity of that infection)

**Component B. Institutional Strengthening**

4. The executing agencies will complete studies during the first year of the project to develop appropriate indicators to monitor the impact of institutional strengthening activities. These indicators will assess, inter alia the impact of training, information systems development, research recommendations, and new or upgraded infrastructure on the coverage, quality and costs of disease control operations.

ENDEMIC DISEASES IN VENEZUELA<sup>1</sup>Malaria

1. Disease Situation. Malaria incidence has risen explosively in recent years from 4,269 reported cases in 1982 to nearly 47,000 reported cases in 1990 (see Table 1), the highest number of cases ever recorded in Venezuela. Malaria is caused by a parasite transmitted by the bite of infected mosquitos. In Venezuela, both the Plasmodium falciparum and Plasmodium vivax species of the malaria parasite are found. The principal vectors of malaria in Venezuela are the mosquito species Anopheles darlingi, A. nuneztovari, A. albimanus, and A. aquasalis.<sup>2</sup> Malaria is an acute, debilitating illness that begins with flu-like symptoms including fever, chills, and drenching sweats that can often come in cycles. The malaria parasite attacks and destroys the red blood cells. Untreated, malaria can be fatal, particularly infections caused by P. falciparum. Persons with no previous exposure to the disease are especially vulnerable. Death may occur, in particular, when infected red blood cells block blood vessels in the brain (this is known as cerebral malaria). Malaria mortality, however, is low in Venezuela -- about 52 malaria deaths were reported in 1990.

2. Since the 1960s malaria incidence has fluctuated in response to changes in the level of control efforts undertaken and to the appearance of colonization or mining activities in highly "receptive" areas where the conditions are favorable to malaria transmission. During the 1960s, colonization in rainforest areas of Tachira, Barinas, and Zulia states, where the vector was already present, was accompanied by a significant increase in malaria transmission. Later, between 1970 and 1973, there was a sharp increase in malaria in the

Table 1:  
Malaria Incidence  
in Venezuela 1960-1990

Year	Cases
1960	1,674
1961	1,754
1962	1,210
1963	2,853
1964	5,884
1965	5,263
1966	5,481
1967	5,257
1968	5,735
1969	8,740
1970	15,288
1971	23,626
1972	18,062
1973	11,687
1974	7,648
1975	5,952
1976	4,768
1977	5,304
1978	5,105
1979	4,722
1980	3,901
1981	3,377
1982	4,269
1983	8,400
1984	12,242
1985	14,305
1986	14,365
1987	17,988
1988	46,279
1989	44,627
1990	46,910

Source: DGSSSA

<sup>1</sup>The following report was prepared for the Venezuela Health Sector Study in April/May 1991 by John Wilson (consultant).

<sup>2</sup>Different anopheline vectors in different areas have been shown to have specific behavioral characteristics. Some, for example, including A. aquasalis, A. darlingi and A. nuneztovari have been known to feed and rest out of doors, thus evading the effects of intradomiciliary spraying.

state of Bolivar following the discovery of a major diamond deposit and the rapid immigration of miners and others. The vector, A. darlingi, was already present and the arrival of infected migrants from other areas quickly led to an epidemic. A similar situation occurred in Bolivar in early 1983 with the discovery of new gold deposits in the municipality of El Dorado. Again there was a massive immigration of miners from other parts of the country, as well as from other countries such as Brazil, Guyana, and the Dominican Republic. By the late 1980s, there were an estimated 80,000 persons in the gold mining areas of Bolivar. Table 2 illustrates the associated rise in malaria.

3. These gold miners are a highly mobile, almost nomadic, group and tend to stay in the mining camps for brief periods of 3 to 6 weeks, after which they return to their home communities. Malaria is thereby exported to other parts of the country including areas which may be highly susceptible to renewed transmission, given the presence of the vector and non-immune populations. The mining camps of Bolivar state have thus had a tremendous impact on the malaria situation in the coastal state of Sucre. The frequent migration of miners to Sucre led rather quickly to the emergence of renewed malaria transmission in an area which had been free of malaria for 15 years (see Table 2). Controlling the vector and eliminating malaria transmission in Sucre was achieved earlier, but with great difficulty, due to the fact that A. aquasalis, the vector in this coastal zone, is highly exophilic and exophagic (preferring to rest and feed outdoors). A. aquasalis has thus been little affected by traditional intradomiciliary spraying. Control efforts were largely based on aerial fogging. The mining camps of Bolivar have thus been responsible for the reinfection of over 100,000 km<sup>2</sup> in the states of Bolivar, Sucre, and Monagas. More recently, gold and diamond mining activity has been growing in the Federal Territory of Amazonas, where malaria cases doubled from 1,305 in 1988 to 2,896 in 1989.

4. Malaria transmission in the mining areas has specific characteristics: (i) it is highly focalized (ii) it is difficult to control with traditional measures such as house spraying due to the lack of sprayable surfaces, or with mass chemotherapy because of the nomadic habits of the miners; (iii) it is difficult to control by use of aerial fogging because the mines are often located in the middle of dense forest where the vector can easily seek shelter; (iv) the chloroquine resistant P. falciparum strains of the parasite are common; and (v) it tends to spread quickly to other areas, where the ecological conditions for renewed transmission are favorable, through the migration of miners.

5. Malaria transmission has also risen in recent years, though less dramatically, in the western part of the country in the states of Apure, Tachira, and Barinas. Transmission in this area is primarily associated with new

Table 2:  
Bolivar and Sucre:  
Reported Malaria 1982-89

Year	Cases	
	Bolivar	Sucre
1982	20	0
1983	505	8
1984	3,585	271
1985	3,225	4,522
1986	3,689	5,302
1987	8,887	2,190
1988	31,003	6,995
1989	27,735	5,513

Source: DGSSSA

colonization activities in Apure state and is also affected by the importation of cases from Bolivar. Malaria transmission in Apure state is focalized in the new settlement areas. Living conditions there are precarious and difficult physical access and guerilla activity (by Colombian rebels) have also complicated control efforts. Fortunately, local transmission appears to be limited to P. vivax, which (unlike P. falciparum) has not presented problems of resistance to anti-malarial drugs.

6. The DGSSSA in Tachira state reported 1,280 cases of malaria in 1990 and has identified several problems: (i) the malaria situation is strongly affected by imported malaria, especially from Apure state; (ii) malaria is easily diffused throughout the state because of its good roads; (iii) climatic conditions are highly favorable to mosquito breeding; and (iv) there is a high density of the vector A. nuneztovari which is less susceptible to intradomiciliary spraying because of its outdoor feeding and resting habits. Although malaria in Tachira averaged around 1,000 to 1,500 cases per year since 1985, local officials are concerned that the number of known local (autochthonous) transmission sites increased from 21 in 1989 to 54 in 1990. If the number of local transmission sites continues to grow in this way, malaria incidence is also likely to grow. At the same time, control program activities have fallen far short of objectives: house spraying and fogging activities reached only 60% and 40%, respectively, of planned coverage in 1990, largely due to labor strikes and to lack of vehicles, fuel, and supplies.

7. Reinforcement of malaria control is urgently needed to reduce transmission, especially in the mining camps, and to halt the further reinfection of receptive areas where malaria was brought under control in the past. The problem and the costs of controlling it have grown without a concomitant increase in the DGSSSA budget. Consequently, funds have been siphoned off from other important disease control efforts. Even so, the malaria control program has still suffered serious shortages of basic inputs such as microlancets, microscopes, microscope lightbulbs, spraying equipment and replacement parts, vehicles and vehicle maintenance. Furthermore, the DGSSSA programs have been seriously compromised by labor problems. In 1990 and 1991 there were frequent work stoppages as DGSSSA field workers, and other MSAS workers hired under "Collective Contract" protested long delays in payment of field allowances. In January and February 1991, for example, DGSSSA workers in Bolivar went on strike and malaria control activities were essentially halted. Fortunately, some activities were continued since part of the labor force was contracted under an agreement with the Corporacion Venezolana de Guayana (CVG), a parastatal regional development corporation, and payments to these workers were not interrupted. The DGSSSA is presently seeking direct control over the Collective Contract funds, now managed centrally by MSAS, in an effort to avoid the delays in payment of workers.

8. Control Activities. Early malaria control efforts in Venezuela sought to control morbidity and transmission by eliminating breeding sites (source reduction) and through mass chemoprophylaxis, using quinine. Objectives shifted to eradication in the early 1950s with the introduction of DDT for intradomiciliary spraying. This method of interrupting the transmission cycle

involves spraying interior walls of houses and associated structures with DDT a residual action pesticide lasting for several months, in order to kill mosquitos that land on the walls after feeding. Between 1945 and 1960, malaria transmission was eliminated from three-fourths of the originally malaria-infested area of the country. After this initial period of success, the country was stratified into "attack" phase and "maintenance" phase areas. The maintenance area is presently comprised of 536 municipalities (460,000 km<sup>2</sup>) with a population of 15 million or 76% of the total population of Venezuela (approximately 20 million in 1990). The attack area is comprised of 34 municipalities (140,000 km<sup>2</sup>) with a population of 670,000 or 3% of the total population.<sup>3</sup> However, as illustrated above, the disease situation has changed dramatically since the original stratification was made in the 1960s. In 1990, malaria incidence in the maintenance area was four times higher than in the attack area, reflecting the significant reinfection of areas where malaria was once brought under control.

9. The basic executing unit of DGSSSA programs in the field are the "demarcations" which are headed by Inspectors. The demarcations in each state report to the Zone Service Chief for Endemic Diseases. Malaria control activities are carried out in the field by teams of spraymen (rociadores) and house visitors (visitadores). There are two types of spraymen teams: one which undertakes the intradomiciliary spraying and another which operates the aerial fogging machines (either truck-mounted or portable). The house visitors provide malaria treatment and collect blood samples from volunteer notification posts, which are taken to DGSSSA field laboratories (usually at the demarcation) for analysis. Visitors and spraymen are supervised by team leaders who are supervised by inspectors.

10. The principal control measures in use are: (i) intradomiciliary spraying with DDT and phenitrothion; (ii) aerial spraying (fogging) with malathion; (iii) treatment of confirmed cases; (iv) mass chemoprophylaxis, or suppressive treatment, in some high risk areas; (v) epidemiological surveillance through passive case detection (taking blood samples from febrile patients who seek assistance at DGSSSA laboratories, health centers, hospitals, volunteer notification posts, etc.) and in some limited areas of especially high transmission, active case detection (visiting houses to take blood samples); (vi) entomological surveillance to study vector distribution, density, behavior, and susceptibility to pesticides in use; and (vii) education activities to promote personal protection measures (including use of impregnated bednets) as well as to enlist community participation in the detection and elimination of vector breeding sites.

11. Ideally, the control program would select a combination of measures which are appropriate for a specific transmission situation. Different areas and situations pose different problems. For example, mining camps may have no

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<sup>3</sup>About one third of the country is classified as "originally without malaria" and has an estimated population of 4 million or 20% of the total population. Although imported cases are found in this area (955 in 1989), known local transmission has been minimal -- only eight cases in 1989.

permanent dwellings and a nomadic population, new settlements have precarious housing, coastal areas have a particularly exophilic vector (A. aquasalis) and peri-urban malaria transmission may be most effectively reduced through drainage works to eliminate breeding sites. The measures selected must take into account the characteristics of specific vector, human and parasite populations, as well as ecological, economic and cultural factors. In practice, however, resource constraints have limited activities in most areas to intradomiciliary spraying, fogging, and passive case detection and treatment.

12. Adjusting Malaria Control Goals and Strategy. The DGSSSA maintains the long-term objective of eradicating malaria, although this has proven an elusive goal given current technological and economic constraints. Alternatively, the DGSSSA intends to control malaria transmission, prevent malaria mortality, and reduce morbidity. To achieve this the DGSSSA plans to carry out a new malaria control strategy utilizing the stratification system and control measures detailed below.

(a) **Strata 1: Areas with Permanent Malaria Transmission (3 subareas).**

(i) **Areas with Stable Populations.** These areas have more settled populations of farmers, ranchers and merchants who live in relatively complete dwellings with sprayable interior walls. In addition to treatment of cases, the control measures to be applied in these areas are intradomiciliary spraying, aerial fogging, and elimination of breeding sites (through drainage, landfill, larvicide application, or biological control of larvae). The impact of these measures on the vector population will be closely monitored. Evaluation of the parasite will be undertaken through active case detection carried out by Rural House Visitors and through passive case detection carried out by the DGSSSA, volunteer collaborators and the local general health services.

(ii) **Areas with Indigenous (tribal) Populations.** This includes a number of different ethnic groups living in the forest in dwellings of various types usually not suitable for intradomiciliary spraying. Spraying would be limited to structures with suitable surfaces. Aerial fogging will also be applied. In emergency situations, health teams will carry out mass blood surveys, on site diagnosis and treatment of cases and individuals living with them, and vector control where possible. Routine epidemiological surveys will be conducted with the participation of religious missions and other institutions located in the indigenous areas and trained indigenous leaders.

(iii) **Mining and Logging Areas.** These highly mobile populations live in precarious dwellings in remote forest areas. Where possible intradomiciliary spraying will be applied. Aerial fogging will be carried out to reduce vector density. The DGSSSA will organize networks of volunteer anti-malarial distributors who

will provide radical treatment of cases, as well as prophylactic treatment of especially vulnerable groups, in order to reduce malaria mortality and morbidity.

(b) **Strata 2: Reinfected Areas (where malaria was earlier under control).**

These areas, where malaria transmission has been re-established, require a comprehensive attack in order to eliminate transmission once again. They will therefore be subject to the same control strategy as (a) above.

(c) **Strata 3: Areas of Eradicated Malaria.**

In these areas the focus will be on maintaining and reinforcing epidemiological surveillance through passive case detection. Any new cases found will be given radical treatment according to established norms for specific parasite species. Any new active foci would be treated by the following measures: mass serological survey, entomological survey, intradomiciliary spraying and aerial fogging, treatment of cases and mass anti-malarial treatment. These measures will continue until the foci is completely eliminated. Parasitological and entomological evaluations would continue for a period of at least one year beyond that time.

In addition, the DGSSSA will maintain vector control and epidemiological surveillance activities in receptive and vulnerable areas contiguous to areas of high malaria transmission. In all of the above Strata, health education activities and promotion of community participation will be carried out by personnel at the regional level.

13. The DGSSSA needs innovative strategies for problem areas like the mining camps of Bolivar state. These will only be found by investing in operational research and by investing in the training and deployment of qualified epidemiologists in the field. The institution has already begun to study new options for control and is rethinking its stratification. In addition, the DGSSSA began a study in 1989 on the risk factors for malaria transmission in Bolivar state (supported by the WHO/UNDP/World Bank Special Programme for Research and Training in Tropical Diseases). It is also conducting field experiments with pesticide impregnated bednets. Regaining control of the malaria situation in Venezuela will be largely a matter of understanding new situations in the field and developing the appropriate tools and strategies to deal with them.

### Dengue

14. Disease Situation. Dengue is caused by an arbovirus which is transmitted to humans by the mosquito vector Aedes aegypti. This vector is amply distributed in Venezuela breeding almost exclusively in man-made containers such as flower pots, water barrels, and discarded tires within or around the household. Since 1950, there have been several epidemic outbreaks

of dengue in Venezuela, the most significant occurring in 1964 (about 18,000 cases), 1966 (8,000 cases), and 1978 (1,200 cases). The most recent outbreak occurred between October 1989 and March 1990 and affected 70% of the area of the country. More than 12,200 cases were reported, and over 2,700 of these were dengue hemorrhagic fever (the first time this more violent form of the disease has been seen in Venezuela). There were 73 fatalities. Table 3 shows the distribution of cases by state.

15. Control Activities. The Aedes aegypti control program began in 1947 as an eradication program and is carried out by the Vector and Reservoir Control Division of the Rural Endemic Disease Control Directorate of DGSSSA. Since the late 1970s, however, the program has been in decline. In 1976, 500,000 house inspections were made and over 120,000 houses were treated. By 1980, only 59,000 houses were inspected and 9,700 treated. By 1989, only 11,700 houses were inspected and only 5,500 treated. Outbreaks of dengue since 1989 have been the result of this decline in epidemiological and virological surveillance which in turn is due to the allocation of scarce DGSSSA resources primarily to malaria control.

Table 3:  
Dengue and Dengue Hemorrhagic Fever  
in Venezuela: 1989-90

	<u>Dengue</u>	<u>Dengue Hemorrhagic</u> <u>Fever</u>
Distrito Fed.	3,185	724
Zulia	1,068	224
Miranda	1,024	150
Aragua	827	827
Falcon	568	71
Carabobo	532	127
Apure	431	17
Trujillo	324	30
Barinas	273	116
Portuguesa	189	54
Lara	182	4
Yaracuy	173	3
Anzoategui	156	18
Cojedes	112	17
Monagas	68	14
Guarico	58	12
Merida	62	1
T.F. Amazonas	46	2
Nueva Esparta	28	0
Solivar	23	0
Delta Amacuro	7	0
Tachira	0	0
Sucre	0	0
Subtotal	9,392	2,670
Total		12,220

Source: DGSSSA

16. The DGSSSA has recognized and advocated the need to establish a National Dengue and Aedes aegypti Control Program. Such a program would involve a number of public health institutions including the National Hygiene Institute (INH), the Venezuelan Scientific Investigation Institute (IVIC), and DGSS, all of which would have an important role in virological, serological, clinical and epidemiological surveillance. Within this program, DGSSSA would undertake Aedes aegypti control (spraying and health education). Also, to help monitor the conditions for viral transmission, the DGSSSA would be responsible for entomological surveillance and would assist other institutions in epidemiological surveillance.

### Chagas Disease

17. Disease Situation. Chagas disease is caused by Trypanosoma cruzi which is transmitted by two triatomine insect vectors: Rhodnius prolixus and Triatoma maculata. Rabbits, small rodents and other small mammals can serve as reservoirs of T. cruzi. R. prolixus is found in 79% of the country (590 of 746 municipalities, covering 714,572 km<sup>2</sup>) and T. maculata is found in 7% of the national territory (55 municipalities covering 63,783 km<sup>2</sup>). The population of this area is an estimated 14.2 million, however, the actual population at risk is limited to low-income households, since the vectors shelter in palm thatch used in walls and roofs, and in the cracks of mud walls (a more precise estimate of population at risk is not available). At night, the triatomine bugs defecate on the skin while feeding on human blood and subsequent scratching of the irritated bite introduces the insect's feces, which carries the Chagas parasite, into the human bloodstream. The early stage of infection may look like malaria, with fever and swollen lymph nodes. This acute phase is on rare occasions fatal, but usually the patient survives and goes through a symptomless phase lasting many months or years. During this period, the parasites invade and severely damage internal organs, especially the heart. There is no cure for Chagas disease, which is usually detected only after major damage has been done. The patient becomes progressively weaker and may eventually die of heart failure.

Table 4:  
Chagas Disease  
in Venezuela: 1985-1989

Year	Total Exams	Tested Positive
1985	8,536	2,433
1986	8,295	1,684
1987	11,794	2,417
1988	4,988	962
1989*	6,509	913

(\* to August only)

Source: DGSSSA

18. In Venezuela, Chagas is found in a belt which runs across the states of Aragua, Guarico, Barinas, Falcon, Merida, Trujillo, Portuguesa, Lara, Zulia, Yaracuy, Cojedes, Carabobo, Miranda, Anzoategui and Sucre. The states known to be most affected are Lara, Portuguesa, Trujillo and Carabobo. In most of the area, the population at risk lives in small and dispersed rural settlements. Table 4 shows reported cases of Chagas disease in recent years. The apparent drop in new cases detected between 1987 and 1988 reflects the deterioration of Chagas surveillance, not an improvement in Chagas control. With the decline in surveillance activities in recent years, it is probable that underreporting of Chagas disease is high.

19. Control Activities. The objectives of the Chagas control program are to interrupt transmission of the disease through vector control (intradomiciliary spraying), construction and improvement of rural dwellings (to eliminate the habitat of the vector in the home), and health education. In the past, Chagas control has benefited indirectly from intradomiciliary spraying of DDT for malaria control. The first epidemiological surveys specifically for Chagas control were begun in 1961. At present the program covers 14 states. As Table 4 shows, coverage in terms of blood samples taken for epidemiological surveillance has fluctuated considerably in recent years. In a number of

states (e.g. Monagas, Anzoategui, Guarico, Sucre, and Portuguesa), however, Chagas control is paralyzed since all resources have been allocated to malaria and dengue control. Plans for control activities in six additional states exist but have not been realized due to lack of resources.

20. Chagas control activities begin with house visits to inspect for the presence of the vector. This is carried out by an inspector. If a house is found to be infested with the vector a team of spraymen treat the dwelling and associated structures on a 4 by 4 month cycle using dieldrin and other pesticides. In addition, house visitors (visitadores) will visit to take blood samples. If positive cases are found they are followed up with an EKG exam (portable EKG equipment is taken to the field) to determine if the victim has heart damage. Inspectors also are responsible for community education. They explain the disease and its transmission and the importance of eliminating thatch construction material and of sealing crevices in walls by covering mud walls with plaster.

21. Poverty plays a central role in the continued transmission of Chagas disease and for this reason the DGSSSA has sought to integrate Chagas control with the National Program for Housing Improvements (MIVICA), run by the Directorate for Rural Housing of DGSSSA. Housing improvement is a logical complement to vector control through residual spraying. However, the MIVICA program is very limited in scope with programs in only three states, Falcon, Portuguesa, and Lara. Although the Chagas control program does provide MIVICA with the epidemiological information to target its activities, MIVICA tends to operate more in areas where the building materials can be readily transported. Thus, the housing needs of areas which are more remote, and usually more affected by Chagas disease, are generally unattended.

22. Resurgent malaria and the recent epidemic of dengue and dengue hemorrhagic fever have had a serious impact on Chagas control activities in 1990. In the state of Portuguesa, for example, almost no vector control was carried out in 1990, since the Chagas program depends on the same spraymen and equipment that are used for malaria and dengue control. In recent years the level of activity in Chagas control has fluctuated considerably, depending on the availability of resources. On the whole, the Chagas control program is underfinanced and requires a major infusion of human and financial resources in order to achieve a reasonable level of coverage. As noted above, there are six states which are known to be areas of Chagas transmission where, for lack of sufficient funds, no control activities are being carried out.

#### Intestinal Schistosomiasis (Bilharzia)

23. Disease Situation. Intestinal schistosomiasis is caused by the parasite Schistosoma mansoni.<sup>4</sup> In water, the larval form of the schistosomes (cercaria) are shed from infected snails and penetrate the skin of people who enter the water to swim, wash, or fish. The snails are infected by another

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<sup>4</sup>Another major form of schistosomiasis found in South America, but not in Venezuela, is urinary schistosomiasis caused by S. haematobium.

stage of the schistosome (miracidia) which hatch from eggs passed in the stools of infected persons. In the human host, the adult male and female forms of the parasite live in the blood vessels of different organs and release eggs that are passed out in stools or that become lodged in the tissues. Schistosomal disease progresses slowly, as a reaction to these eggs in the tissues. It is characterized by progressive enlargement of the liver and spleen and damage to the intestine resulting from lesions around the eggs and hypertension of the abdominal blood vessels. Repeated bleeding from these vessels can be fatal. The data from coprological exams in Venezuela show that persons over 10 years of age are slightly more affected than persons under 10 but recent serological studies suggest that not enough is known about schistosomiasis in Venezuela to say which, if any, population group is most affected.

24. Based on the coprological data, and on knowledge of the distribution of infected snail populations, S. mansoni is known to be endemic in Venezuela's most densely populated region, the center-north. The endemic area covers an estimated 15,000 km<sup>2</sup> or 1.6% of the country, and includes the Federal District and parts of the states of Aragua, Carabobo, Guarico and Miranda. The population of this area is approximately 7 million, of which an estimated 2 million people are actually at risk. The presently known distribution of the disease corresponds to the distribution of the snail intermediate host, Biomphalaria glabrata.<sup>5</sup> The socio-economic conditions and habits of the population in the endemic area are generally amenable to the persistence of this disease. In some areas (e.g. Aragua and Carabobo) the problem is aggravated by brick manufacturers who are extracting clay and leaving behind huge water-filled pits that are soon infested by B. glabrata. These flooded clay pits are often adjacent to poor, crowded barrios and are inevitably used by the population. Other problem areas include new low-income neighborhoods that have appeared in low-lying peri-urban areas of the cities of Maracay and Valencia.

25. Surveillance of schistosomiasis in Venezuela has varied greatly since 1943 when surveillance activities began. Between 1943 and 1960, DGSSSA made 87,639 feces exams of which 12,851 or 14% were positive for S. mansoni. Between 1986 and 1989, DGSSSA made 125,062 feces exams of which 719 or 0.6% were positive. These data suggest that schistosomiasis control activities, mainly mollusciciding, have been very effective over the years in reducing prevalence of the disease. However, the introduction of new serological diagnostic methods have raised some important questions. In 1989, DGSSSA collected 2,062 serological samples in Carabobo state, and found 789 or 38.7% to be positive for S. mansoni. Another 1,350 blood samples were examined in 1990 of which 358 or 26.5% were positive. Thus, it seems that actual prevalence of schistosomiasis may be much higher than previously estimated. It may be that lighter infections do not show up in the coprological exams but do show up in the serological tests. The implication for control is that,

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<sup>5</sup>S. mansoni has sometimes been found in two other potential snail intermediate hosts, B. straminea and B. havanensis, which are distributed over most of Venezuela.

with the more sensitive serological diagnostic tool, the schistosomiasis control program could identify and treat a much larger percentage of infected individuals and significantly strengthen efforts to eliminate the disease.

26. Control Activities. Since 1943, schistosomiasis control has used a polyvalent strategy attacking the major points in the transmission cycle: the intermediate host through mollusciciding, the parasite through chemotherapy (using Oxamniquine or Praziquantel), and the human reservoir through education. Control activities have included epidemiological surveys, hydrographic studies, malacological (snail) surveillance, mollusciciding in infested waters, drainage works, construction of sidewalks, washing places (lavaderos), public baths and latrines, treatment of cases, and health education.

27. As in malaria control, each state where the schistosomiasis control program operates is divided into demarcations. The principal control activities for schistosomiasis in Venezuela underway today are snail control, epidemiological surveillance and treatment, and community education. Snail control activities are carried out by specialized teams of workers: some workers clear the underbrush along water courses so that others, following behind, can use small nets to capture snails. When infested bodies of water are found, captured snails are taken to Maracay for testing. The infested waters are treated by the same teams with molluscicide (primarily Baylucid, but also sodium pentachlorophenate, copper sulfate, Frescon, and sodium citrate). The worker teams are supervised by an inspector. In 1989, 10.4 million linear meters of water courses were inspected. The program planned to treat 881,000 linear meters but due to increasing costs and insufficient transport and personnel, covered only 50% of this goal (441,000 linear meters).

28. Epidemiological surveillance is carried out by inspectors in areas where infected snails are found by collecting feces samples for diagnostic testing (mainly at the DGSSSA laboratory in Maracay). This is followed up by treatment of positive cases. There is a new plan, however, which has yet to be financed, which would train inspectors and workers to take blood samples for a new schistosomiasis surveillance system based on serological surveys. Community education is carried out by the inspectors with assistance from specialists from DGSSSA headquarters. Efforts to change the high risk behaviors of populations at risk need considerable strengthening, however.

29. Operational research on biological control is being carried out in collaboration with the School for Advanced Studies of the University of Perpignan (France) and the Guadaloupe Island Hospital Center. The objective of the project is to examine the impact on B. glabrata of the introduction of a competitor snail, Thiara tuberculata. A Schistosomiasis Research Group was formed in 1984, to help orient the activities of the schistosomiasis control program, which is comprised of the head schistosomiasis control program and representatives from the Bilharzia Laboratory of the Tropical Medicine Institute of the Central University of Venezuela, the Department of Parasitology of the University of Carabobo and the Schistosomiasis Laboratory of the Center for Microbiology and Cellular Biology of the Institute for

Scientific Investigation (IVIC). The objective of the group is to work together towards improving diagnosis, treatment and control of schistosomiasis in Venezuela.

30. The schistosomiasis control program needs to reassess the epidemiological situation, based on serological surveys, and to develop a control or eradication strategy, accordingly. To do so, greater investment in schistosomiasis control will be needed since, for several years, resources for schistosomiasis control have been used to help combat resurgent malaria. In addition, schistosomiasis control suffered a major setback in 1990 due to the transfer of its manpower to the dengue control effort. Field activities have slowed due to labor strikes and lack of funds to pay field allowances. The schistosomiasis program requires basic transport of its own to achieve adequate coverage and resources are needed to undertake small drainage works, especially in new peri-urban areas where the risk of intensified transmission is high. Coordination with state and municipal authorities to encourage such works and to maintain existing drainage canals is also needed. Laboratory space and equipment, new supplies, and re-training of personnel are urgently needed and the program would also benefit greatly from computerization of the its information system to manage the epidemiological and snail surveillance systems.

#### Other Intestinal Parasites

31. Disease Situation. The prevalence of helminthic infections is a consequence of poor living standards and, specifically, of the inadequate disposal of human wastes. The most recent epidemiological survey of intestinal parasites in Venezuela began in 1989 after a lapse of 13 years since the previous survey of 1976. The new survey, which should be completed

by late 1991, adds information on parasite load and covers the same localities studied in 1976 in order to allow an analysis of the impact of control measures applied. Thus far, 33,457 samples from 15 states have been processed with the results shown in Table 5. These preliminary data appear to indicate that the anti-helminth campaign of the last 13 years has resulted in a significant decline in prevalence.

Species	% positive	
	1976	1989
T.trichiura	83.3	35.0
A.lumbricoides	4.5	29.1

32. Control Activities. The objective of the control program for intestinal helminths is to reduce infection to a level that no longer constitutes a public health problem. The program is carried out throughout most of the country and targets the principal geo-helminths: Ascaris lumbricoides, Trichuris trichiura, Ancylostomidae (Necator americanus and Ancylostoma duodenale), and Enterobius vermicularis. The principal activities of the control program, which are executed by the Zone Service personnel based at the state level, include:

- (a) Epidemiological surveillance to determine parasite indices and health/sanitation surveys of households and communities.
- (b) Education campaigns in the schools and in the community.
- (c) Latrine construction with participation of beneficiaries in construction and provision of materials.
- (d) Mass anti-helminth treatment through schools and communities (local health centers) with Mebendazole (single dose 500mg preceded by one day with single dose of piperazine). The program has operated best through the schools, where treatment is administered twice a year.

33. The program's budget has not kept pace with rising costs and population growth. Coverage has therefore been lower than projected: 34% for latrine construction and 74% for antihelminthic treatment (1989). The figures on latrine construction over the last two decades show a very strong declining trend: only 786 latrines were constructed in 1990 as compared to an average of 1,496 per year in the period 1985-89, 1,597 in the period 1984-88, 4,220 in the period 1979-83, and 10,376 in the period 1974-78. Until 1990, the Ministry of Health was providing funds to DGSSSA to purchase building materials for latrines for needy beneficiaries. This support has been terminated and now beneficiaries must be able to furnish all the materials.

34. At present, DGSSSA has sole responsibility for intestinal parasite control. Coverage could be easily expanded and improved through the involvement of the general health services in the control program.

### Leprosy

35. Leprosy (also known as Hansen's disease) is caused by a slow growing bacterium, Mycobacterium leprae, which grows mainly in nerve cells and macrophage cells in the skin. The clinical course of leprosy varies from asymptomatic infections to severe disfiguring disease. Skin lesions may appear and heal spontaneously. As the disease progresses, usually over many years, the skin lesions may become more frequent. These lesions range from depigmented patches, usually with loss of skin sensitivity, to multiple nodules with extensive skin thickening and folding. Loss of sensitivity in the skin often results in unnoticed burns or ulcers. Lesions of the nerves can lead to muscle weakness and atrophy resulting in deformities, especially of the hands and feet. The disease leads to disfigurement and disability due to injuries resulting from loss of nerve sensation. The mode of transmission is not clearly known but it is generally accepted that prolonged and intimate contact with the source of infection is necessary. The bacterium is believed to be transmitted mainly from the nasal discharge of infected people, but may also be transmitted by skin contact.

36. In 1991, Venezuela had 13,616 registered cases of leprosy. The number of new cases reported in the last decade is summarized in Table 6. The rise in new cases detected each year does not indicate a worsening situation, but

reflects improvements in surveillance. The IB estimates that over the last 40 years, the incidence of leprosy has actually declined from 16/100,000 in 1951 to 1/100,000 in 1990. In 1981, the IB stratified the country into three areas: (i) the high prevalence area, with greater than 2 cases per 1,000 population, comprised of the states of Merida, Tachira, Trujillo, Barinas, and Apure; (ii) the medium prevalence area with between 1/1,000 and 2/1,000, comprised of the states of Nueva Esparta, the Federal District, Portuguesa, and Guarico; and (iii) the low prevalence area with less than 1/1,000, comprised of the rest of Venezuela.

37. The principal activity in control of leprosy is epidemiological surveillance of patients and their contacts and supervised treatment in order to interrupt transmission by reducing incidence. This is carried out at the state level by the SDDs. The latter are, ideally, but not always, staffed with a doctor, nurse, field inspector, and social worker (all of them do have a doctor, however). In addition, the leprosy program carries out health education geared to changing attitudes about the disease, focusing on its curability, low infectivity, and the benefits of immunoprophylaxis. Rehabilitation activities are also undertaken in some areas to reduce incapacitation in patients who lose sensitivity, especially in the hands and feet (such patients tend to injure themselves in routine activities).

38. For many years the only treatment for leprosy was dapsone, a drug which halts the multiplication of the bacterium. Treatment was lengthy, sometimes life-long, there was risk of relapse, and resistance to dapsone was appearing in many areas. However, a newly developed multi-drug therapy (MDT) has been in use in Venezuela since 1985. MDT combines dapsone, rifampicin and clofazimine. A total of 5,445 patients have received MDT (a coverage of 87%) of which 1,980 cases (32%) have successfully completed treatment. MDT is implemented in all states except Tachira, Apure, and Merida (where immunoprophylaxis is being tested) and Bolivar, due to difficulty of access and other problems associated with such frontier regions. The IB is also working on immunotherapy, using the same compound which is being tested as a vaccine, described below. So far, the IB is encouraged by the results of immunotherapy, claiming that 90% of patients treated have responded positively.

39. Venezuela is one of several countries now working on prevention of leprosy through vaccination. The objective is to reduce prevalence and incidence by protecting high risk contacts. As areas of high prevalence,

Table 6:  
New Cases of Leprosy  
in Venezuela 1980-89

<u>Year</u>	<u>New Cases</u>
1980	333
1981	365
1982	375
1983	357
1984	372
1985	411
1986	455
1987	438
1988	490
1989	419

Source: Biomedicine Institute

Apure, Tachira, and part of Merida were selected for an immunoprophylaxis study which is testing a vaccine made of dead M. leprae and a compound called B.C.G. At the beginning of the study, an epidemiological survey was conducted: 2,294 cases were registered and their 64,572 contacts (people at highest risk of contracting the disease) were identified. Of these contacts, 29,116 received the vaccine. The contacts are examined annually. <sup>6</sup> So far, the IB is encouraged by the results and hopes to expand the program to all endemic areas in the country.

40. The Institute for Biomedicine needs to undertake a comprehensive evaluation of the leprosy control program in all states and territories. Based on such a review, surveillance and treatment activities should be strengthened in areas which are presently underserved (especially more remote areas with weaker health infrastructure such as Amazonas and Bolivar). In addition, the results of the immunoprophylaxis and immunotherapy studies now underway should be evaluated as soon as possible with a view to determining whether these studies should be expanded, in order to make these alternative therapies available to leprosy patients and contacts throughout the country.

#### Leishmaniasis

41. Leishmaniasis is caused by a parasite transmitted by infected sandflies (genus Lutzomyia in Venezuela) which breed in moist soils, for example, in forest areas, caves or burrow of small rodents. Several species and subspecies infect man, leading to symptoms ranging from simple self-healing skin ulcers to life-threatening disease. Small mammals including rodents and dogs, serve as reservoir hosts of infection and may play an important part in the epidemiology of the disease. In Venezuela, two forms of leishmaniasis are found: L. tegumentar americana (also called cutaneous and mucocutaneous leishmaniasis) and L. visceral or Kala-Azar. The former is more common and its symptoms may range from simple skin ulcers to major tissue destruction, especially of the nose and mouth. Visceral leishmaniasis is a more serious form of the disease and usually fatal if untreated - its symptoms include fever, malaise, weight loss and then anemia and swelling of spleen, liver and lymph nodes. Simple cutaneous leishmaniasis can heal by itself without medical intervention, leaving the person immune to further infection from that particular form of the disease. However, some cases of mucocutaneous leishmaniasis (as well as

Table 7:  
Cutaneous and Mucocutaneous  
Leishmaniasis  
in Venezuela, 1955-1989

<u>Year</u>	<u>Cases</u>
1955 to 1980	16,728
1981	1,203
1982	1,507
1983	1,640
1984	2,100
1985	2,557
1986	2,677
1987	2,486
1988	2,664
1989	1,899

<sup>6</sup>The study is supported by TDR, CONICIT, MSAS, and PAHO.

visceral leishmaniasis) are extremely difficult to treat and may require a long course of pentavalent antimony drugs (Glucantime or Pentostam) and sometimes the antibiotic amphotericin B.

42. Cutaneous and mucocutaneous leishmaniasis have been reported in nearly all states in Venezuela with the exception of Nueva Esparta and T.F. Delta Amacuro (see Table 7). Underreporting is high and there may be as many as 10 cases unreported for every reported case. Table 7 summarizes the reported cases of cutaneous and mucocutaneous leishmaniasis in Venezuela since 1955. The IB has classified the different states where transmission occurs into active foci: Lara, Tachira, Merida, Trujillo, Barinas, Miranda, Anzoategui, Sucre, T.F. Amazonas, Zulia; and slightly active foci: Bolivar, Cojedes, Falcon, Monagas, and the Federal District. A few small foci of L. visceral have been found in five states: Lara, Guarico, Sucre, Anzoategui and the Federal District. Incidence of visceral leishmaniasis has been about 50 new cases per year.

43. The control strategy for leishmaniasis (LTA) in Venezuela involves: (i) active case detection utilizing trained community leaders and local health services (as well as development of new diagnostic techniques); (ii) register, treatment and follow up of cases (as well as study of new therapies and immunotherapies); (iii) studies of the vector, reservoirs, epidemiology and immunology of known foci; (iv) health education in high risk areas focusing on vector avoidance (use of bednets and insect repellents); and (v) training programs for local health service personnel.

44. The IB is carrying out important studies on a vaccine for leishmaniasis which may be useful in both prevention and treatment of the disease. The Rafael Rangel National Institute of Hygiene has an agreement with the IB to assist in vaccine production.

### Onchocerciasis

45. Onchocerciasis is caused by a thread-like worm, Onchocerca volvulus, which is spread by the bite of the female blackfly (Simulium metallicum, Simulium exiguum, Simulium Pintoi, and Simulium Guasianequineum in Venezuela). Victims of onchocerciasis suffer severe debilitation and itching due to the proliferation of millions of infant worms (microfilariae) produced by adult worms (macrofilariae) located in nodules under the skin. Years of repeated reinfection and eventual microfilarial migration to the eyes will lead to severe ocular damage and blindness (hence, onchocerciasis is known as Riverblindness in Africa). In Venezuela, onchocerciasis is found in the eastern states of Anzoategui, Monagas, and Sucre, the central states of Aragua, Miranda, Carabobo, Guarico, Cojedes, and Yaracuy, and the southern states of Bolivar and Amazonas. The IB estimates that there are approximately 80,000 cases of onchocerciasis in Venezuela. However, a complete and systematic mapping of onchocerciasis in Venezuela is still needed, including an assessment of the extent of blindness due to onchocerciasis.

46. Onchocerciasis control activities are limited to passive surveillance and treatment of cases with ivermectin (Mectizan), an effective

microfilaricide recently in use since 1987. Ivermectin treatments must be administered yearly for the lifespan of the adult parasite (11 to 14 years) since ivermectin does not kill the adult worm. In Venezuela, vector control was attempted for a short period between 1959 and 1965. The effort was halted, however, because of its high cost and because it did not have a significant impact on vector density. Effective control of onchocerciasis in Venezuela would require an active epidemiological surveillance system, as well as a program for mass ivermectin treatment in important foci across the country.

VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT

DGSSSA Expenditures for  
Endemic Disease Control  
1985 - 1990  
(1990 US\$ millions)

<u>Year</u>	<u>MSAS/a</u>	<u>States/b</u>	<u>CVG</u>	<u>Total</u>
1985	32.1	38.0	0	70.1
1986	33.4	36.8	0	70.2
1987	27.2	28.3	0	55.5
1988	24.5	27.0	0	51.5
1989	18.8	15.4	2.9	37.1
1990	16.1	29.5	2.2	47.8
1991	25.4	39.8	3.1	68.3

CVG: Venezuelan Corporation of Guayana

MSAS: Ministry of Health and Social Assistance

a/ MSAS figure does not include MSAS contributions to Rural Housing, Aqueduct, and Sewers Programs of the Rural Housing Autonomous Service

b/ this amount is largely in support of the Rural Housing, Sewers and Aqueducts Programs.

IB Expenditures for  
Endemic Disease Control  
1986 - 1990  
(1990 US\$ '000)

<u>Year</u>	<u>MSAS /a</u>	<u>UCV /b</u>	<u>Subtotal</u>	<u>/c</u>	<u>TDR</u>	<u>Total</u>
1986	493	194	687	178	100	865
1987	443	199	642	121	100	864
1988	445	196	642	87	100	829
1989	369	189	558	132	100	790
1990	352	197	549	130	120	799

TDR: WHO/UNDP/World Bank Special Programme for Research and Training in Tropical Diseases; supports leishmaniasis immunoprophylaxis program (vaccine production and field expenses)

a/ Personnel expenditures, all IB disease control programs.

b/ Personnel expenditures, all IB research and training programs.

c/ AMERICARES: supports Leprosy Multidrug Therapy (MDT) program (drugs and field expenses).

VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT  
SELECTED BACKGROUND DOCUMENTS AVAILABLE IN PROJECT FILE

**A. Reports and Documents Related to the Project**

- A.1 "Proyecto Control de Enfermedades Endemicas: Malarilogia y Saneamiento Ambiental". Volumes I and II. Direccion General Sectorial de Saneamiento Sanitario Ambiental (DGSSSA), Caracas, February 1992.
- A.2 "Proyecto Control de Enfermedades Endemicas en Venezuela, Banco Mundial, Programas de Lepra, Leishmaniasis y Oncocercosis, Desarrollo de Infraestructura Fisica". Biomedicine Institute, Caracas, November 1991.
- A.3 Action Plans for 1993 and Review of Disease Control Strategies. Institute of Biomedicine. June 1992.
- A.4 Action Plans for 1993 and Review of Disease Control Strategies. General Sectoral Directorate for Environmental Sanitation. June 1992.
- A.5 Venezuela Health Sector Study (yellow cover), June 1992, The World Bank, Washington, D.C.
- A.6 "Selection and Use of Pesticides in Bank Financed Projects". Norman Gratz and Bernhard H. Liese. The World Bank, PPR Working Paper Series, Number 11, Washington, D.C., 1988.
- A.7 "Guidelines for the Selection and Use of Pesticides in Public Health Programs in Bank-financed Projects". The World Bank, OPN 11.04

**B. Reports and Working Papers Related to the Sub-Sector**

- B.1 Staff Appraisal Report - Brazil - Amazon Basin Malaria Control Project. The World Bank, Report Number 7535-BR, Washington D.C., April 21, 1989.
- B.2 Organizing and Managing Tropical Disease Control Programs: Lessons of Success. Bernhard H. Liese, Paramjit S. Sachdeva and D. Glynn Cochrane. World Bank Technical Paper Number 159, 1991.
- B.3 "The Onchocerciasis Control Program in West Africa: A Long-term Commitment to Success". Bernhard H. Liese, John Wilson, Bruce Benton, and Douglas Marr. The World Bank, PPR Working Paper Series, Number 740, August 1991, Washington, D.C.
- B.4 "Development Policies and Health: Farmers, Goldminers and Slums in the Brazilian Amazon". John F. Wilson and A. Alicibusan-Schwab. The World Bank, Environment Department, Divisional Working Paper, Number 1991-18, January 1991.

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ENDEMIC DISEASE CONTROL PROJECT

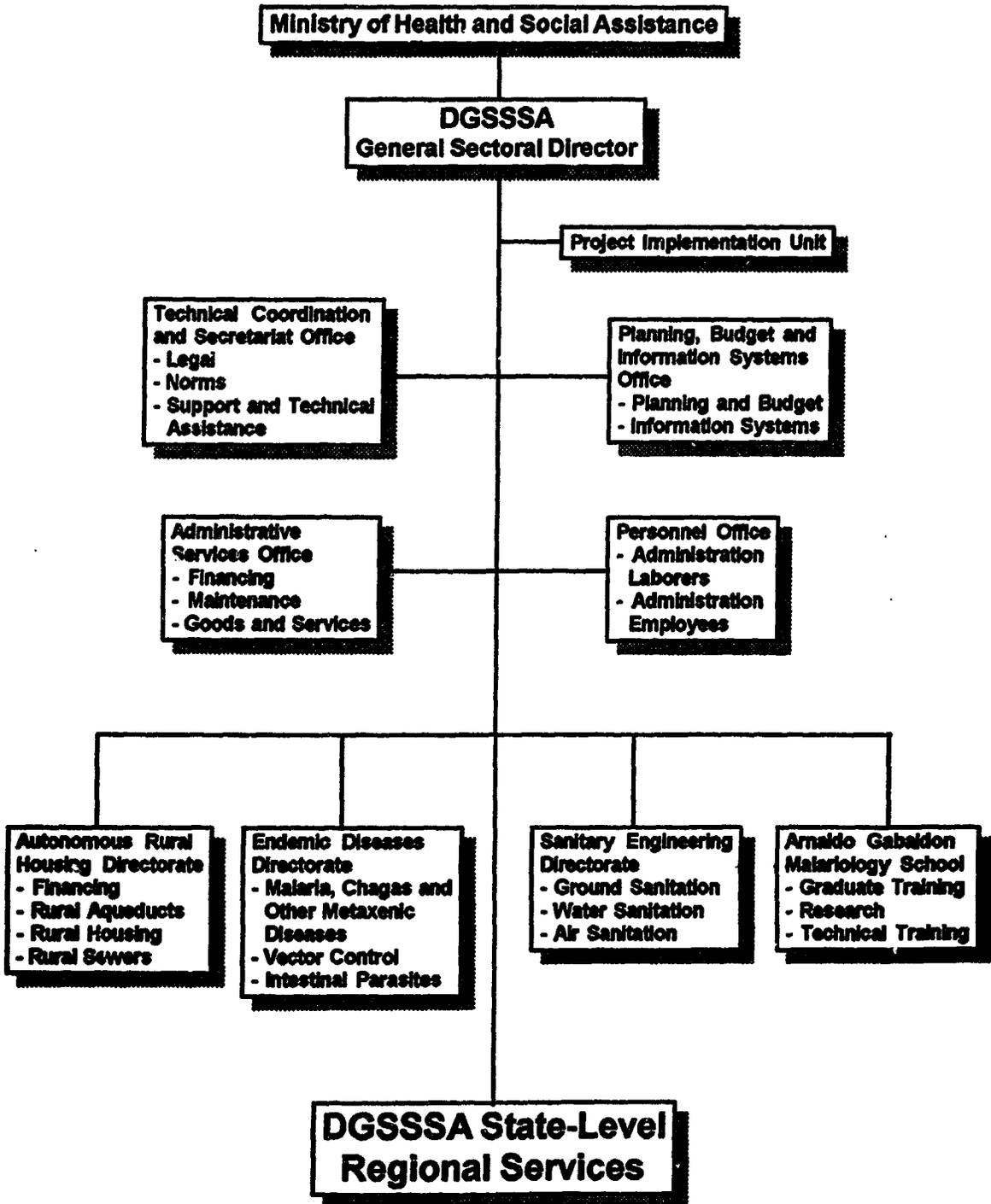
ANNEX  
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ANNUAL SUPERVISION PLAN

- Supervision Skills:** Task Manager (Coordinating with Procurement, Disbursement and Legal)  
Epidemiologist/Endemic Disease Control Specialist  
Architect  
Information Systems Specialist  
Project Implementation Monitoring Specialist  
Anthropologist/Sociologist
- Year Round Actions:** Review and follow up on bidding documents, contracts, and operational research proposals.
- January - February:** Project Launch Seminar (1993 only). Bank Participants: Manager, Procurement Officer, Disbursement Officer, Law Endemic Disease Control Specialist. Follow up.
- March:** Review at headquarters of: Annual Project Implementation report on previous year's activities;  
Proposed annual action plan and investment program for the then subsequent year and the report on expenditures during the previous fiscal year; and  
DGSSSA plan to implement recommendations of management (1993 only).
- Undertake supervision mission for, inter alia: Joint a review with Borrower of: (i) progress in project execution and achievement of project objectives using input and outcome indicators in Annex 6 of Staff Appraisal Report (ii) proposed annual action plan and investment program for the then subsequent year; (iii) any changes in project design and implementation that may be necessary; and (iv) mechanism for DGSSSA management of all resources for payment of DGSSSA field workers. Supervision report writing and follow up.
- April:** Follow up.
- May - June:** Review final proposed budget of the Executive Branch submitted to the Congress (for the then following fiscal year) to confirm that it includes adequate allocation for endemic disease control programs and activities. Follow up.
- July - August:** Review annual audit. Follow up.
- September:** Supervision Mission. Review implementation of action plan and field operations. Supervision report writing. Follow up.
- October - December:** Follow up.

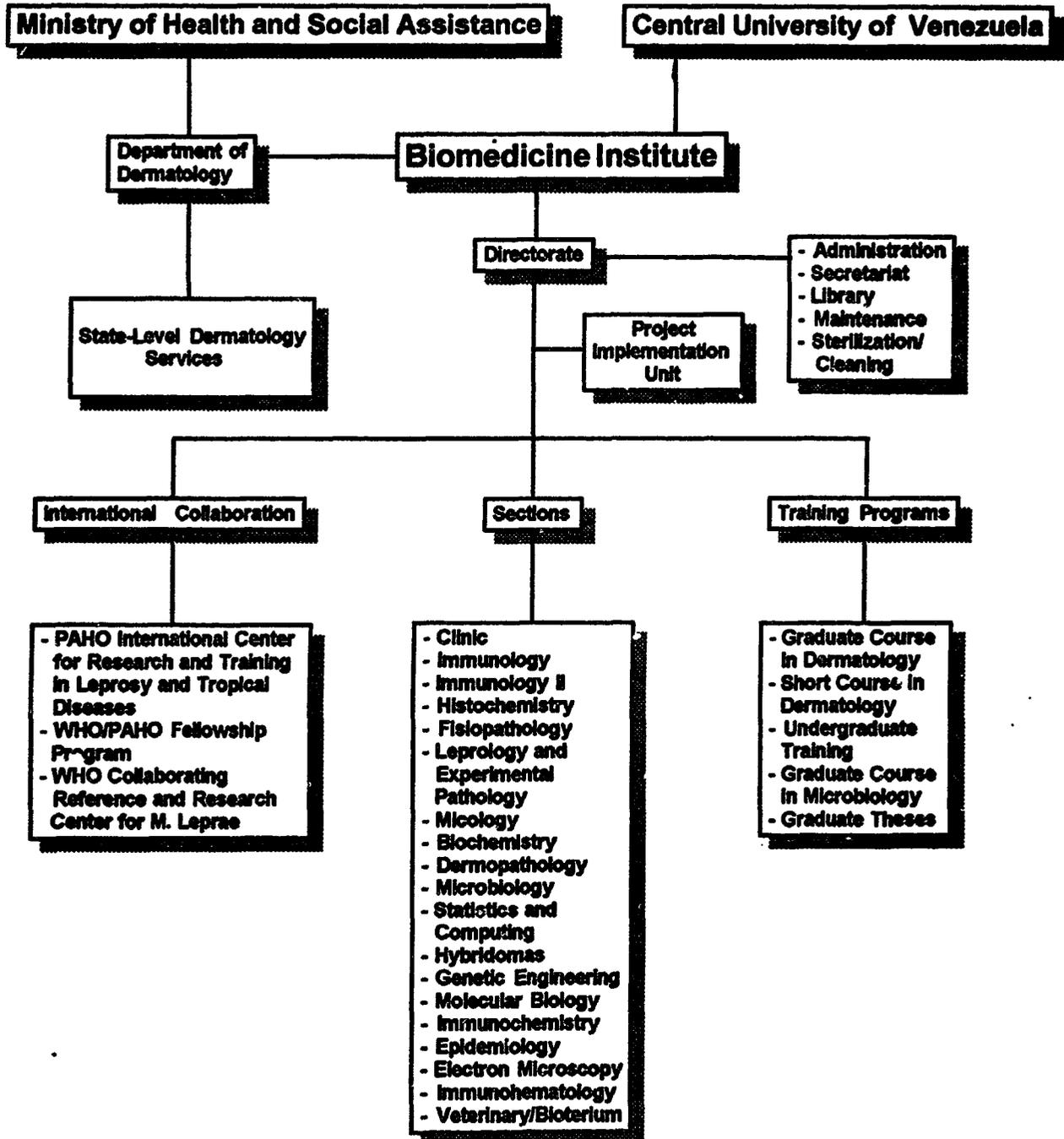
VENEZUELA  
 ENDEMIC DISEASE CONTROL PROJECT

Organization Chart of the General Sectoral Directorate  
 for Environmental Sanitation

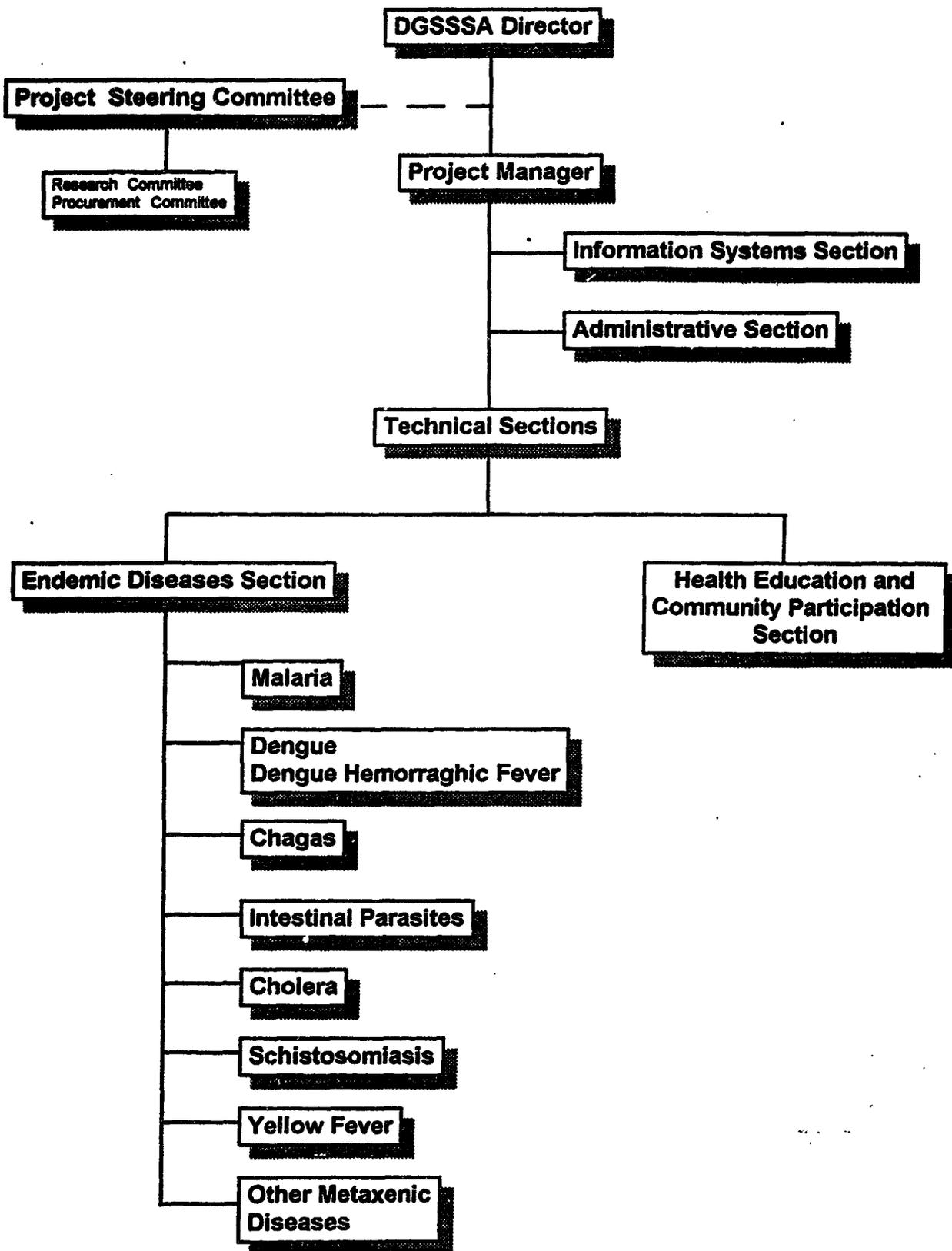


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ENDEMIC DISEASE CONTROL PROJECT

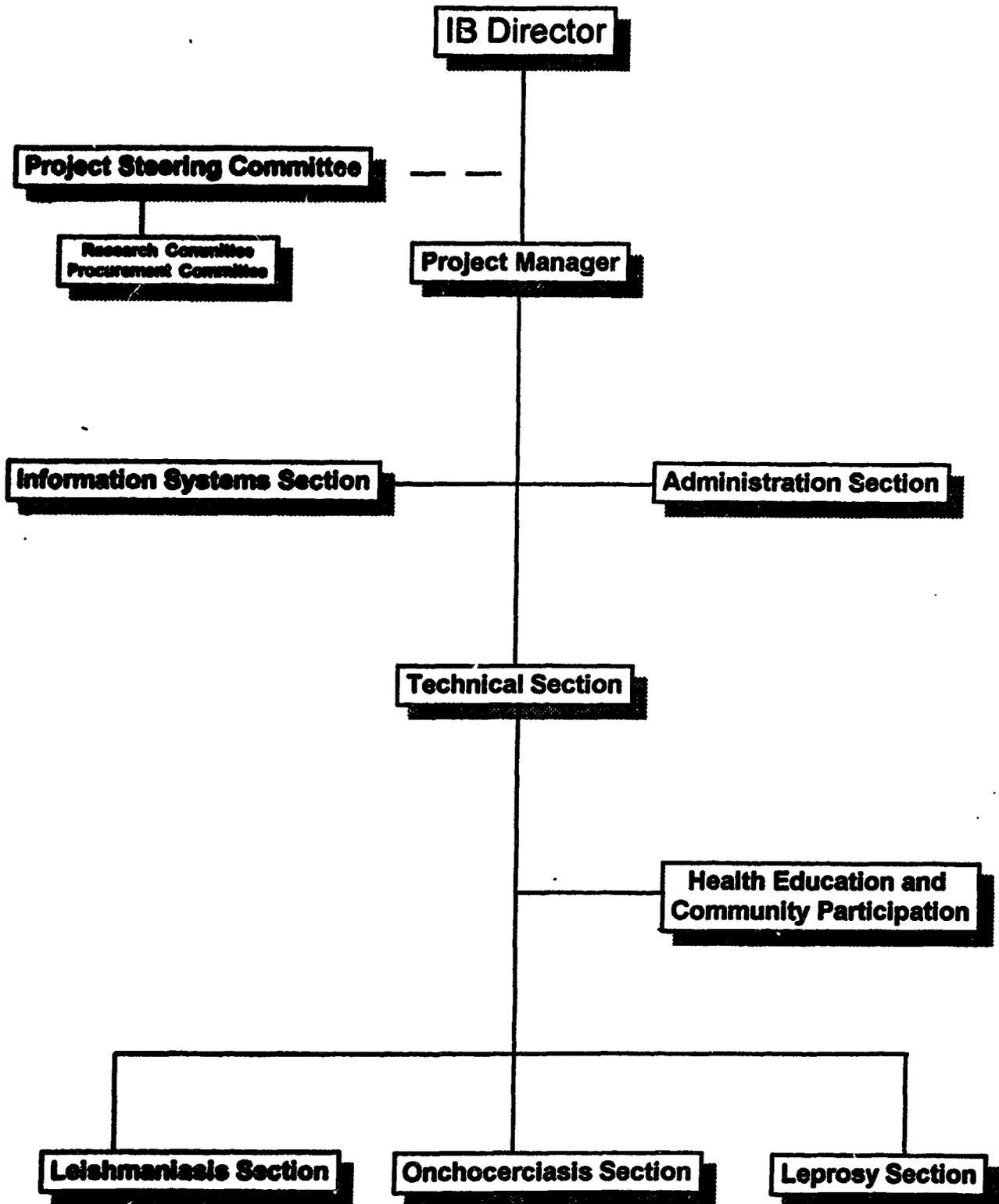
Organization Chart of the Biomedicine Institute



VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT  
DGSSSA PROJECT IMPLEMENTATION UNIT



VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT  
IB PROJECT IMPLEMENTATION UNIT



VENEZUELA  
ENDEMIC DISEASE CONTROL PROJECT  
PROJECT COMMITTEES

