directing council

PAN AMERICAN HEALTH ORGANIZATION
XXIII Meeting

regional committee

WORLD HEALTH ORGANIZATION
XXVII Meeting

Washington, D. C.
September-October 1975

Provisional Agenda Item 23

CD23/21 (Eng.)
2 September 1975
ORIGINAL: ENGLISH-SPANISH

STATUS OF MALARIA ERADICATION IN THE AMERICAS

XXIII REPORT

TABLE OF CONTENTS

GRAPHS, MAPS AND TABLES

Tables (Cont.)

Country tables showing the status of the Malaria Eradication Programs at December 1974

REPORT ON THE STATUS OF MALARIA ERADICATION IN THE AMERICAS

XXIII REPORT

Introduction

The Director of the Pan American Sanitary Bureau has the honor to submit to the XXIII Meeting of the Directing Council the XXIII Report on the Status of Malaria Eradication in the Americas.

This report presents the current status of the malaria eradication program in this region, summarizing statistical information up to the end of 1974. The report consists of six chapters. The first contains the general policy of the Organization, an overall review of progress, problems encountered and a general strategy for future activities. The second chapter describes the present status of the program in the Hemisphere as a whole, followed by a progress report country-by-country. The third chapter summarizes special technical problems observed and the remedial measures taken to solve them. The fourth describes the major research activities undertaken during 1974 and the fifth refers to the training of personnel. The sixth and final chapter gives information on international cooperation in malaria eradication programs.

Information was provided by the countries in a special questionnaire, and in periodic statistical reports. The data provided by the PAHO project for research in malaria, by PAHO consultants and by PAHO-sponsored evaluation teams were also included when appropiate.

I. OVERALL REVIEW OF MALARIA ERADICATION PROGRAMS

The XIX Pan American Sanitary Conference held in Washington, D.C., during September-October 1974 reaffirmed the targets for malaria eradication set in the Ten-Year Health Plan for the Americas and urged the Governments to continue their efforts and to provide the resources essential for attaining them. In line with the resolution adopted by the 27th World Health Assembly, the Conference recommended to the Governments and the Regional Director of PASB to study thoroughly the problems which hamper progress and to reexamine the priority accorded the program in order to determine its future strategy, and requested the II Meeting of the Directors of NMES to propose effective measures for the implementation of said recommendation.

The mentioned Meeting of Directors took place on 21-26 April 1975, in Quito, Ecuador.

Considering the Hemisphere as a whole, the malaria programs did not make any substantial progress in 1974. The number of malaria cases registered for 1974 totaled 269,003, comparing favorably to 280,276 recorded for 1973. Of the 22 political units which have active malaria programs, an increase in malaria cases was observed in eight and a decrease in 14. El Salvador, Nicaragua and Surinam showed the most serious deterioration, while Argentina, Brazil, Colombia, Guatemala and Venezuela made substantial gains as far as the number of cases is concerned. In the rest of the countries, the situation remained unchanged during 1974.

In general, the programs suffered from shortage of insecticides and antimalarial drugs and deficiencies of spraying equipment and transport. In some programs, spraying operations were suspended or coverage reduced due to late arrival of insecticides or shortage of them. The world-wide inflation and energy crisis have affected not only prices, but also delivery schedules for the elements needed for the programs. In most countries there were increases in the national malaria budgets, but such increases were more than offset by higher costs of material and adjustments of salaries and wages. To assist the Governments in Central America to obtain adequate financing for their malaria programs, the Organization took the initiative to discuss with the Central American Bank for Economic Integration the possibility of aid to these programs. At the end of September 1974, the Directorate of the Bank announced its disposition to participate in financing such programs.

Vector resistance to insecticides continued to be a serious problem for the countries of Central America. Since 1971, propoxur has been in use in El Salvador,

Guatemala, Honduras and Nicaragua, on the Pacific coast where A. albimanus is resistant to DDT. A good result was obtained until 1973 in all four countries where propoxur was applied. However, vector resistance to propoxur appeared in many localities in El Salvador in 1973 and increased in intensity and extension in 1974. The same problem, although of lesser magnitude, was also observed in Guatemala and Nicaragua during 1974. As a complementary or substitute measure, antimalarial drugs were used to reduce mortality and to prevent outbreaks.

Intercountry coordination of eradication operations and vigilance activities became more important among those groups of neighboring countries having different degrees of malaria endemicity. As a tool of such coordination, PAHO sponsored or organized the following border meetings during the year: French Guiana and Surinam (16-17 Jan.), Belize and Guatemala (7-9 Feb.), Colombia and Panama (28-29 March), Argentina and Paraguay (26-27 June), Brazil and Paraguay (8-9 Oct.), Mexico and Belize in June, and 3 meetings between Costa Rica and Panama.

Of the 34 countries and political units which originally had malarious areas in the Americas, 12 had achieved eradication in their entire territories before the year under report and these were maintained free of malaria transmission throughout the year. Another three units where the program has reached the consolidation and/or maintenance phase in all malarious areas further improved their situation by reducing malaria incidence and the number of residual foci. The remaining 19 units continued the application of attack measures in at least some part of their territories, although five units have practically interrupted malaria transmission in the greater part of their territories.

Following the criteria used in the previous report, these 34 units have been categorized into three groups. Table 1 shows the countries and population in each group.

In Group I there are 12 political units with 69,272,000 inhabitants (34.5 per cent of the total in the malarious areas), in which malaria eradication has been achieved. These countries and territories have maintained and are expected to be able to continue to maintain the status of malaria eradication with their current epidemiological situation.

Group II consists of eight units having a total of 12,804,000 inhabitants (6.4 per cent) at the end of 1974. This group continues to show a good prospect of achieving malaria eradication with a time-limited plan and therefore every effort should be made to eliminate the few residual foci within their territories. The principal problem continues to be the organization and maintenance of an effective vigilance system to prevent reintroduction of malaria. Although development of the basic health services to a point at which they can take over the responsibility for malaria vigilance should be considered to be the next step required to insure the final achievement, this must be done without affecting the current efficiency of the ME program. Inadequately planned integration of malaria eradication services with general health services or the diversion of malaria resources to other activities will endanger current progress and will raise the risk of reestablishment of malaria endemicity. It is essential that both national and international supports be continued or intensified if necessary, in order to reach the goal of eradication and to provide an adequate mechanism for its maintenance.

Group III includes 14 political units with 118,679,000 inhabitants, which can be subdivided into two parts: the first, with 58,017,000 inhabitants (28.9 per cent), is the area in the consolidation and/or maintenance phases where transmission is interrupted or focalized in a few residual foci. However, the area is highly vulnerable and is often subject to fluctuation in malaria incidence, depending on the magnitude of importation of cases from the second part of this Group. Although regular attack measures have been suspended, preventive and emercency measures have often been necessary to maintain the current status in some areas, particularly in those adjacent or epidemiologically related to the attack phase area in the second subdivision of the Group. Surveillance operations are generally very costly, and they require painstaking efforts to maintain their efficiency. The second subdivision with 60,662,000 inhabitants, includes areas in attack phase, where malaria transmission is still widely present. It is in these areas where multiple and interrelated problems have been encountered. In general, financial and administrative problems are the most intense and widespread, further complicated in recent times by general inflation and the energy crisis. It is also here that serious technical problems are observed; multiple physiological resistance of the vector to insecticides in certain areas in Central America, behavioral resistance to insecticides in some areas in Colombia and Venezuela, and resistance of malaria parasites to choroquine in many areas in South America have made it necessary to use expensive alternative or complementary attack

measures. Furthermore, intensive agricultural programs and construction of roads and dams have created ecological conditions favorable for transmission and motivated a great movement of laborers between non-endemic and endemic areas. Under present conditions, it is of vital importance to study the problems area-by-area and to apply the measures most suited to the epidemiological situation. A total coverage with a single attack measure is no longer effective in areas with multiple problems.

Table 1

CLASSIFICATION OF MALARIA ERADICATION PROGRAMS IN RELATION TO PROGRESS ACHIEVED
AS OF 31 DECEMBER 1974

GROUP I Malaria eradication achieved		GROUP II Malaria eradication in sight, if the current progress continues		GROUP III		
					Population (in thousands)	
Countries	Population (in thousands)	Countries	Population (in thousands)	Countries	Part I Malaria eradication achieved (Maintenance phase) or transmission interrupted (Consolidation phase)	Part II Malaria eradication continues (Attack phase)
Chile	222	Argentina	3 014	Bolivia	1 052	713
Cuba .....[a]	3 186	Costa Rica	635	Brazil	19 359	22 745
Granada and Carriacou	36	Dom. Republic ...	4 533	Colombia	9 630	4 522
Jamaica	1 610	Guyana	803	Ecuador	1 697	2 305
Trinidad & Tobago	841	Panama	1 558	El Salvador	0	3 362
U.S.A. (Continent) ...	59 868	Canal Zone	48	Guatemala	0	2 281
Puerto Rico	2 797	Paraguay	2 078	Haiti	0	3 927
Virgin Islands	75	Belize	135	Honduras	484	2 020
Dominica	15		-	Mexico	13 347	14 746
Guadeloupe	306		-	Nicaragua	0	2 180
Martinique	214		-	Peru	4 046	1 305
St. Lucia	102		-	Venezuela	8 123	517
	-		-	French Guiana	44	6
	-		-	Surinam	235	33
12 Units	69 272 34.5%	8 Units	12 804[b] 6.4%	14 Units	58 017 28.9%	60 662 30.2%

a) 1973 Population. b) 2,524,000 inhabitants are in areas in the attack phase.

II. PRESENT STATUS OF MALARIA ERADICATION PROGRAMS

A. General situation

The estimated population of the Americas at 31 December 1974 was 544,865,000 persons, of which 200,755,000 (36.8 per cent) resided in originally malarious areas. Of the latter figure, 91,527,000 (45.6 per cent) lived in areas in which malaria has been eradicated (maintenance phase), 46,042,000 (23.0 per cent) in areas in which malaria transmission has been interrupted (consolidation phase) and 63,130,000 (31.4 per cent) in areas where transmission still exists and attack measures are being applied (attack phase). Compared with the status at 31 December 1973, there was no significant change as between phases of the program except that Panama transferred and area with 418,000 inhabitants from attack to consolidation phase and Brazil suspended attack measures in an area with 2.5 million inhabitants as a preliminary step towards transfer from attack to consolidation phase. To facilitate a rapid evaluation of the evolution of the program, the population in different phases is given in Table 2, year by year, from 1958 to 1974. Maps 1 and 2 show the geographical extension of each phase of the program as of December 1973 and 1974 and Tables 3 and 4 give the population and the area in square kilometers by phase of the program and by country.

Considering the Hemisphere according to geographic subregion (Graph 1), the whole of North America is in the maintenance phase. In Middle America (Mexico, Central America, Panama and the Caribbean islands), 48.7 per cent of the population is in consolidation and maintenance phases and in South America, 59.7 per cent.

In 1974, a total of 8,997,318 blood slides was examined among 200,755,000 inhabitants living in the malarious areas, representing an annual blood examination rate (ABER) of 4.48 per cent. The number of cases was 280,276 in 1973 and 269,003 in 1974. Of the 22 programs in the Region, eight produced between 171 and 520 cases during the whole year of 1974. Two countries, Brazil and El Salvador together registered a total of 133,172 cases or 49.5 per cent of all malaria cases found in the Region. Table 5 gives the summary of blood smears examined and malaria cases detected in the Americas from 1958 to 1974 and Table 6 shows the number of smears examined and the number of positives detected in 1974 in each country by phase of the program.

The area in the maintenance phase includes 20 political units with 91,527,000 inhabitants. A total of 921,927 blood slides was examined in 18 political units and 3,055 malaria cases were found. Of these, 1,817 or 59.5 per cent were in Venezuela, 673 of them being autochthonous. These were mainly due to an outbreak in a new mining community, which spread cases over the areas in the maintenance phase. The situation was brought under control by the end of 1974. Table 7 shows the numbers of cases found in areas in the maintenance phase and their classification and the origin of the infection, by country.

There are 17 political units which have areas in the consolidation phase with a total population of 46,042,000. During the year, 1,784,059 blood smears were examined with 8,377 positive for malaria parasites. Of the cases, Colombia and Peru reported 65.8 per cent or 5,513 cases in total. In both countries, malaria surveillance activities were very much reduced during the year, because of shortage of funds (Table 8).

The area in the attack phase extended over 20 political units with 63,130,000 inhabitants. In 1973, Argentina did not have area in this phase, but in 1974 it was decided to return a part of the area in consolidation to attack phase for operational purposes. A total of 6,008,587 blood slides was examined in all programs and 253,586 cases were detected. Table 9 gives the breakdown of this information by country.

In the originally non-malarious area, 282,745 blood slides were examined with 3,985 positive cases. The majority of these cases were imported from areas in attack phase within the same country (Table 10).

The malaria mortality registered for the period from 1969 to 1973 is shwon in Table 11 by country.

Table 2

EVOLUTION OF MALARIA ERADICATION
IN THE AMERICAS, BY PHASE 1958-1974

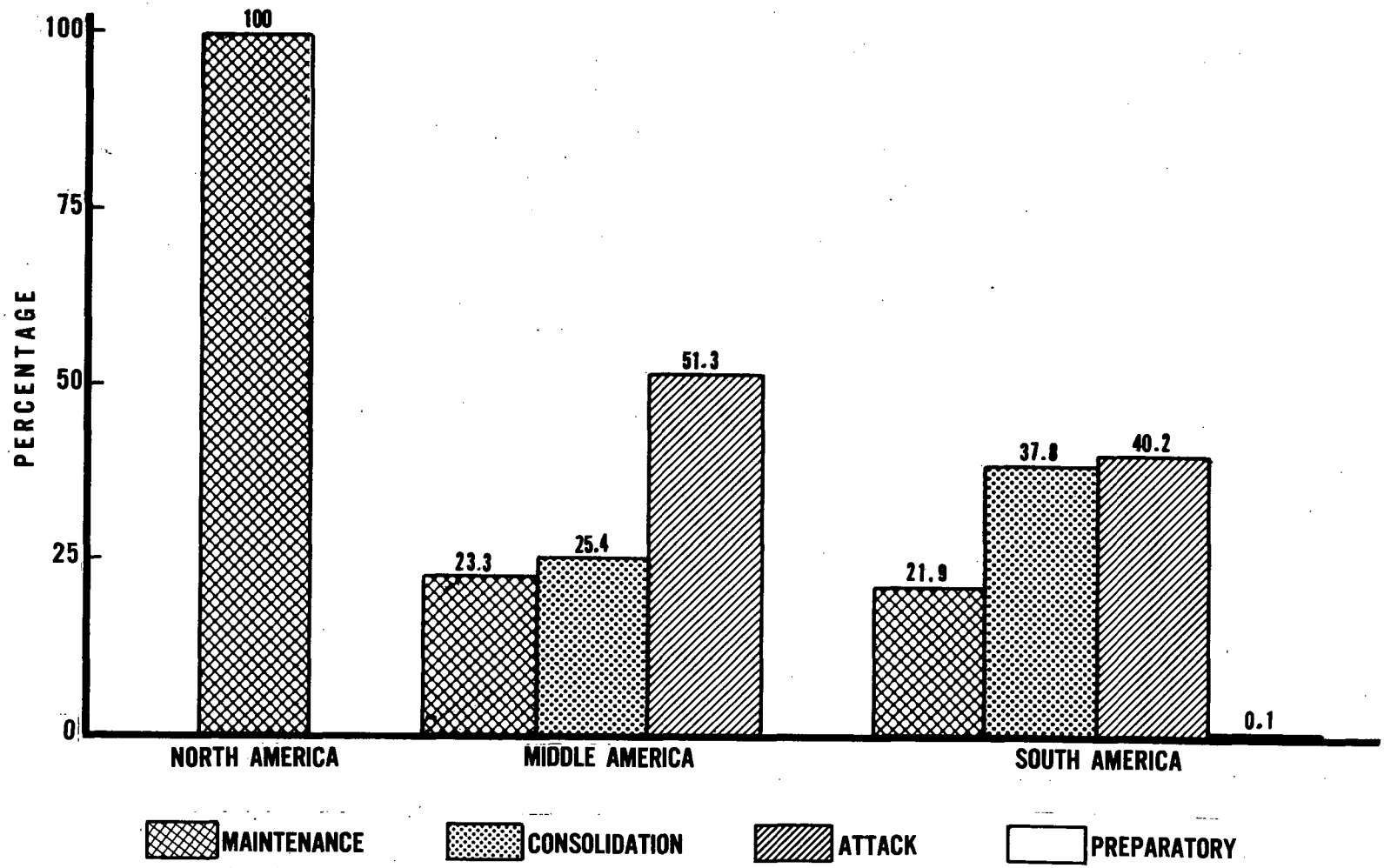
(Population in thousands)

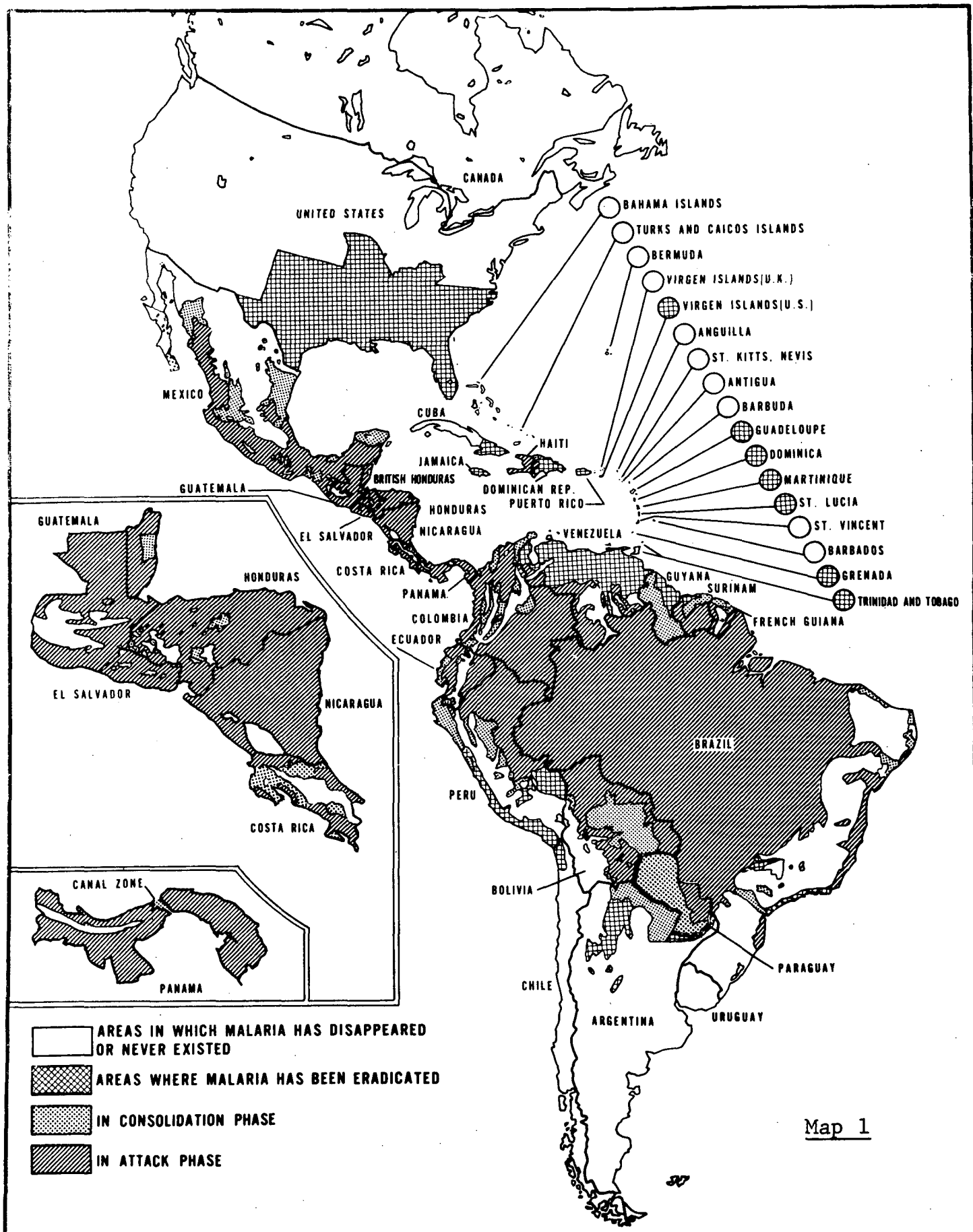
Year	Originally malarious areas					Total population
	Maint. phase	Consolid. phase	Attack phase	Prep. phase or program not yet started	Total	
1958	52 866	1 996	46 196	34 351	135 409	387 276
1959	52 856	9 349	56 292	27 423	145 920	394 606
1960	54 363	10 101	53 400	25 722	143 586	400 500
1961	56 979	17 879	39 021	33 413	147 292	416 008
1962	59 299	30 424	49 276	14 743	153 742	427 919
1963	56 546	33 901	31 910	29 664	152 021	434 950
1964	57 414	32 277	34 426	34 525	158 642	447 666
1965	60 975	34 731	38 575	12 108	146 389	455 527
1966	69 760	36 128	43 369	17 212	166 469	463 649
1967	70 720	41 581	44 766	12 834	169 901	474 868
1968	72 441	45 812	56 234	217	174 704	484 664
1969	72 757	46 987	56 375	206	176 325	491 483
1970	80 770	40 518	59 807	162	181 257	505 819
1971	81 306	43 644	60 396	146	185 492	513 544
1972	86 634	42 016	61 645	153	190 448	524 774
1973	87 969	45 535	61 915	109	195 528	535 109
1974	91 527	46 042	63 130	56	200 755	544 865

GRAPH 1

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY REGION, 1974

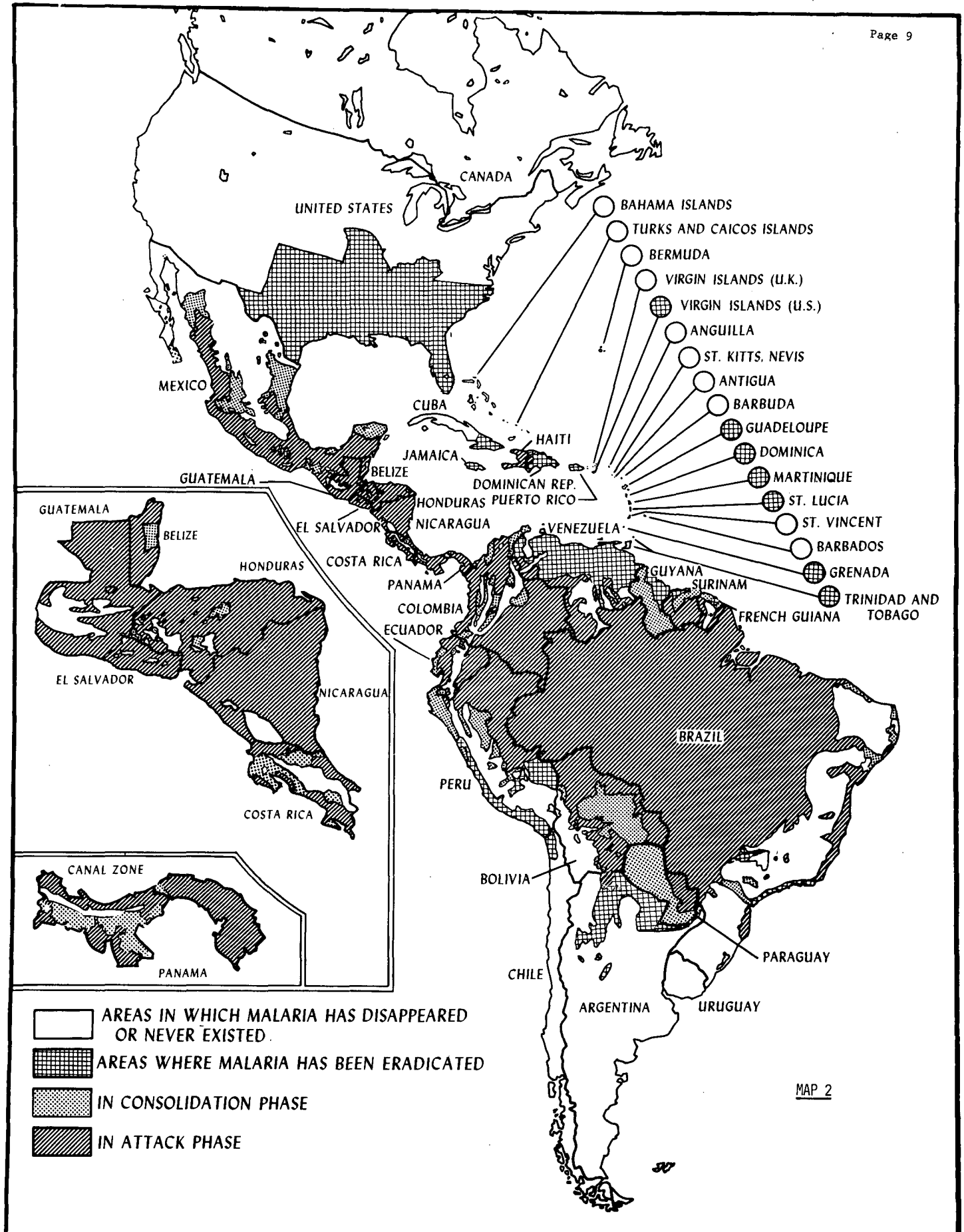
POPULATION BY PHASE AS A PERCENTAGE OF ORIGINALLY MALARIOUS AREA





Map 1

STATUS OF THE MALARIA ERRADICATION PROGRAM IN THE AMERICAS , 31 DECEMBER 1973



MAP 2

STATUS OF THE MALARIA ERRADICATION PROGRAM IN THE AMERICAS I, 31 DECEMBER 1974

Table 3

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY POPULATION, 1974

(Population in thousands)

Country or other political or administrative unit	Total population	Population of originally malarious areas									
		Total		Malaria eradication claimed (maintenance phase)		Consolidation phase		Attack phase		Prep. phase or program not yet started	
		Total	%	Total	%	Total	%	Total	%	Total	%
Argentina	24 650[a]	3 014	12.2	2 820	93.6	58	1.9	136	4.5	-	-
Bahamas	193[a]	-	-	-	-	-	-	-	-	-	-
Barbados	243[a]	-	-	-	-	-	-	-	-	-	-
Bolivia	5 482	1 765	32.2	-	-	1 052	59.6	713	40.4	-	-
Brazil	104 642	42 104	40.2	4 470	10.6	14 889	35.4	22 745	54.0	-	-
Canada	22 480	-	-	-	-	-	-	-	-	-	-
Chile	10 536	222	2.1	222	100.0	-	-	-	-	-	-
Colombia	23 952	14 152	59.1	-	-	9 630	68.0	4 466	31.6	56	0.4
Costa Rica	1 908	635	33.3	-[b]	-	437	68.8	198	31.2	-	-
Cuba	9 090	3 186	35.0	3 186[b]	100.0	-	-	-	-	-	-
Dominican Republic	4 562	4 533	99.4	4 408	97.2	35	0.8	90	2.0	-	-
Ecuador	6 501	4 002	61.6	-	-	1 697	42.4	2 305	57.6	-	-
El Salvador	3 932[a]	3 362	85.5	-[b]	-	-	-	3 362	100.0	-	-
Grenada and Carriacou	95[a]	36	37.9	36[b]	100.0	-	-	-	-	-	-
Guatemala	5 347	2 281	42.7	-	-	-	-	2 281	100.0	-	-
Guyana	803	803	100.0	754	93.9	49	6.1	-	-	-	-
Haiti	5 318	3 927	73.8	-	-	-	-	3 927	100.0	-	-
Honduras	2 866	2 504	87.4	-[b]	-	484	19.3	2 020	80.7	-	-
Jamaica	2 041	1 610	78.9	1 610[b]	100.0	-	-	-	-	-	-
Mexico	56 495	28 093	49.7	-	-	13 347	47.5	14 746	52.5	-	-
Nicaragua	2 180	2 180	100.0	-	-	-	-	2 180	100.0	-	-
Panama	1 618	1 558	96.3	-	-	418	26.8	1 140	73.2	-	-
Paraguay	2 494	2 078	83.2	-	-	1 174	56.5	904	43.5	-	-
Peru	15 351	5 351[c]	34.9	1 465[b]	27.4	2 581	48.2	1 305	24.4	-	-
Trinidad and Tobago	1 064[a]	841[c]	79.0	841[b]	100.0	-	-	-	-	-	-
United States of America	211 390	59 868	28.3	59 868[b]	100.0	-	-	-	-	-	-
Uruguay	3 027	-	-	-	-	-	-	-	-	-	-
Venezuela	11 518	8 640	75.0	8 123[d]	94.0	-	-	517	6.0	-	-
Antigua	74[a]	-	-	-	-	-	-	-	-	-	-
Bermuda	55[a]	-	-	-	-	-	-	-	-	-	-
Belize	135	135	100.0	-	-	79	58.5	56	41.5	-	-
Canal Zone	48	48	100.0	-	-	48	100.0	-	-	-	-
Cayman Islands	11	-[c]	-	-[b]	-	-	-	-	-	-	-
Dominica	73[a]	15[c]	20.5	15[b]	100.0	-	-	-	-	-	-
Falkland Islands	2[a]	-	-	-	-	-	-	-	-	-	-
French Guiana	50	50	100.0	25	50.0	19	38.0	6	12.0	-	-
Guadeloupe	350[e]	306[c]	87.4	306	100.0	-	-	-	-	-	-
Martinique	343[a]	214[c]	62.4	214	100.0	-	-	-	-	-	-
Montserrat	12[a]	-	-	-	-	-	-	-	-	-	-
Netherland Antilles	234[a]	-	-	-	-	-	-	-	-	-	-
Puerto Rico	2 919[a]	2 797	95.8	2 797[b]	100.0	-	-	-	-	-	-
St. Kitts, Nevis, Anguilla	65	-	-	-	-	-	-	-	-	-	-
St. Lucia	108	102	94.4	102[b]	100.0	-	-	-	-	-	-
St. Pierre and Miquelon	6	-	-	-	-	-	-	-	-	-	-
St. Vincent	91	-	-	-	-	-	-	-	-	-	-
Surinam	418	268	64.1	190	70.9	45	16.8	33	12.3	-	-
Turks and Caicos Islands	6	-	-	-	-	-	-	-	-	-	-
Virgen Islands (U.K.)	12	-	-	-	-	-	-	-	-	-	-
Virgen Islands (U.S.A.)	75	75	100.0	75[b]	100.0	-	-	-	-	-	-
Total	544 865	200 755	36.8	91 527	45.6	46 142	23.0	62 130	31.4	56	0.03

a) 1973 population. b) Population in areas where eradication of malaria has been certified by PAHO/WHO. c) Estimated. d) Includes an area with 6,112,309 inhabitants where eradication of malaria has been certified by PAHO/WHO. e) 1973 population given by country.

Table 4

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY AREA, 1974

(Area in Km^2)

Country or other political or administrative unit	Total area	Originally malarious areas									
		Total		Malaria eradication claimed (maintenance phase)		Consolidation phase		Attack phase		Prep. phase or program not yet started	
		Total	%	Total	%	Total	%	Total	%	Total	%
Argentina	4 024 458	349 051	8.7	317 378	90.9	3 249	0.9	28 424	8.1	-	-
Bahamas	11 396	-	-	-	-	-	-	-	-	-	-
Barbados	430	-	-	-	-	-	-	-	-	-	-
Bolivia	1 098 581	821 346	74.8	-	-	367 940	44.8	453 406	55.2	-	-
Brazil	8 511 965	6 897 891	81.0	82 402	1.2	188 496	2.7	6 626 993	96.1	-	-
Canada	9 221 016	-	-	-	-	-	-	-	-	-	-
Chile	741 767	55 287	7.5	55 287	100.0	-	-	-	-	-	-
Colombia	1 138 914	970 849	85.2	-	-	113 176	11.7	845 605	87.1	12 068	1.2
Costa Rica	50 900	35 446	69.6	-	-	19 941	56.3	15 505	43.7	-	-
Cuba	114 524	37 502	32.7	37 502[a]	100.0	-	-	-	-	-	-
Dominican Republic	48 442	47 562	98.2	44 280	93.1	537	1.1	2 745	5.8	-	-
Ecuador	291 906	175 462	60.1	-	-	27 797	15.8	147 665	84.2	-	-
El Salvador	21 149	18 655	88.2	-	-	-	-	18 655	100.0	-	-
Grenada and Carriacou	342	103	30.1	103[a]	100.0	-	-	-	-	-	-
Guatemala	108 889	80 350	73.8	-	-	-	-	80 350	100.0	-	-
Guyana	215 025	215 025	100.0	39 437	18.3	175 588	81.7	-	-	-	-
Haiti	27 750	19 100	68.8	-	-	-	-	19 100	100.0	-	-
Honduras	112 088	101 351	90.4	-	-	7 123	7.0	94 228	93.0	-	-
Jamaica	11 428	10 028	87.7	10 028[a]	100.0	-	-	-	-	-	-
Mexico	1 967 183	1 150 000	58.5	-	-	424 694	36.9	725 306	63.1	-	-
Nicaragua	127 358	118 358	92.9	-	-	-	-	118 358	100.0	-	-
Panama	75 650	69 840	92.3	-	-	16 231	23.2	53 609	76.8	-	-
Paraguay	406 752	406 552	100.0	-	-	301 189	74.1	105 363	25.9	-	-
Peru	1 285 215	961 171	74.8	195 818	20.4	221 930	23.1	543 423	56.5	-	-
Trinidad and Tobago	5 605	5 444	97.1	5 444[a]	100.0	-	-	-	-	-	-
United States	9 359 781	2 309 601	24.7	2 309 601[a]	100.0	-	-	-	-	-	-
Uruguay	186 926	-	-	-	-	-	-	-	-	-	-
Venezuela	912 050	600 000	65.8	460 054[b]	76.7	-	-	139 946	23.3	-	-
Antigua	280	-	-	-	-	-	-	-	-	-	-
Bermuda	53	-	-	-	-	-	-	-	-	-	-
Belize	22 965	22 965	100.0	-	-	8 811	38.4	14 154	61.6	-	-
Canal Zone	1 432	1 432	100.0	-	-	1 432	100.0	-	-	-	-
Cayman Islands	183	-	-	-	-	-	-	-	-	-	-
Dominica	751	152	20.0	152[a]	100.0	-	-	-	-	-	-
Falkland Islands	11 961	-	-	-	-	-	-	-	-	-	-
French Guiana	90 000	90 000	100.0	200	0.2	82 300	91.5	7 500	8.3	-	-
Guadeloupe	1 779	1 136	63.9	1 136	100.0	-	-	-	-	-	-
Martinique	1 080	300	27.8	300	100.0	-	-	-	-	-	-
Montserrat	84	-	-	-	-	-	-	-	-	-	-
Netherland Antilles	961	-	-	-	-	-	-	-	-	-	-
Puerto Rico	8 896	8 896	100.0	8 896[a]	100.0	-	-	-	-	-	-
St.Kitts, Nevis, Anguilla	396	-	-	-	-	-	-	-	-	-	-
St. Lucia	603	510	84.6	510[a]	100.0	-	-	-	-	-	-
St.Pierre and Miquelon	240	-	-	-	-	-	-	-	-	-	-
St. Vincent	389	-	-	-	-	-	-	-	-	-	-
Turks and Caicos Islands	522	-	-	-	-	-	-	-	-	-	-
Surinam	163 820	163 750	100.0	8 955	5.5	55 345	33.8	99 450	60.7	-	-
Virgin Islands (U.K.)	174	-	-	-	-	-	-	-	-	-	-
Virgin Islands (U.S.A.)	344	344	100.0	344[a]	100.0	-	-	-	-	-	-
Total	40 384 403	15 745 459	39.0	3 577 827	22.7	015 779	12.8	10 139 785	64.4	12 068	0.1

a) Area where eradication of malaria has been certified by PAHO/WHO. b) Includes an area with 407 945 Km^2 where eradication of malaria has been certified by PAHO/WHO.

Table 5

SUMMARY OF CASE DETECTION IN THE AMERICAS, 1958-1974

Year	Number of slides examinded	Number of slides found positive
1958	1 716 103	56 705
1959	2 749 117	75 612
1960	3 955 149	79 998
1961	5 341 004	99 539
1962	7 221 367	177 089
1963	7 903 156	227 026
1964	8 156 290	254 572
1965	9 069 950	241 462
1966	11 731 451	333 245
1967	11 609 226	369 341
1968	12 522 696	282 773
1969	12 179 190	323 782
1970	9 925 187	344 027
1971	10 133 524	338 296
1972	9 671 730	277 912
1973	9 400 766	280 144
1974	8 997 318	269 003

Table 6

CASE DETECTION BY COUNTRY AND PHASE OF PROGRAM 1974

Country or other political or administrative unit	Total		Maintenance phase		Consolidation phase		Attack phase		Non-malarious areas	
	Slides examined	Positive cases	Slides examined	Positive cases	Slides examined	Positive cases	Slides examined	Positive cases	Slides examined	Positive cases
Argentina	71 168	171	59 026	33	5 423	20	6 719	118	-	-
Bolivia	114 805	4 936	-	-	20 001	260	93 969	4 597	835	79
Brazil	2 271 691	66 481	24 307	291	519 526	894	1687 989	63 504	39 869	1 792
Chile	30	0	30	0	-	-	-	-	-	-
Colombia	404 120	22 406	-	-	210 847	3 404	191 587	18 908	1 686	94
Costa Rica	154 656	152	-	-	81 408	51	72 864	71	384	30
Cuba	444 366	38	268 390	7	-	-	-	-	175 976	31
Dominican Republic	360 782	520	317 695	229	8 072	0	35 006	291	9	0
Ecuador	314 685	5 481	-	-	122 979	294	191 269	5 177	437	10
El Salvador	478 553	66 691	-	-	-	-	446 466	65 297	32 087	1 394
Guatemala	421 240	4 030	-	-	-	-	416 954	3 877	4 286	153
Guyana	42 549	72	8 308	4	34 241	68	-	-	-	-
Haiti	357 546	25 441	-	-	-	-	357 546	25 441	-	-
Honduras	287 842	7 503	-	-	21 790	120	264 940	7 353	1 112	30
Jamaica	23 579	1	23 579	1	-	-	-	-	-	-
Mexico	1 822 307	26 800	-	-	431 325	858	1 371 139	25 836	19 843	106
Nicaragua	233 941	12 167	-	-	-	-	233 941	12 167	-	-
Panama	368 820	1 184	-	-	79 989	3	288 831	1 181	-	-
Paraguay	124 803	101	-	-	54 424	1	68 359	98	2 020	2
Peru	317 522	12 485	67 242	177	132 605	2 109	117 675	10 199	-	-
Trinidad and Tobago	...	1	...	1	-	-	-	-	-	-
United States	190[a]	260	190	260	-	-	-	-	-	-
Venezuela	240 547	7 648	142 745	1 817	-	-	96 510	5 610	1 292	221
Belize	23 100	96	-	-	8 480	29	14 620	67	-	-
Canal Zone	29 082	2	-	-	29 082	2	-	-	-	-
Dominica	...	...	...	...	-	-	-	-	-	-
French Guiana	9 153	351	2 769	214	2 130	83	4 254	54	-	-
Grenada and Carriacou	...	...	...	...	-	-	-	-	-	-
Guadeloupe	...	...	...	...	-	-	-	-	-	-
Puerto Rico	...	1	...	1	-	-	-	-	-	-
St. Lucia	2	0	2	0	-	-	-	-	-	-
Surinam	80 239	3 984	7 644	20	21 737	181	47 949	3 740	2 909	43
Total	8 997 318	269 003	921 927	3 055	1 784 059	8 377	6 008 586	253 586	282 745	3 985

a) Slides examined at CDC.

Table 7

EPIDEMIOLOGICAL EVALUATION IN AREAS UNDER MAINTENANCE PHASE IN MALARIA ERADICATION PROGRAMS, 1974

Country or other political or administrative unit	Number of Slides examined	Total No. of positive cases	Species of parasite				Origin of infections							
									Imported					
			P.falciparum	P.vivax	P.malariae	Mixed infections	Autochthonous	Relapsing	from abroad	from[a] areas within country	Induced	Introduced	Criptic and Unclassified	No investigated
Argentina	59 026	33	-	33	-	-	2	3	8	6	-	9	3	2
Brazil	24 307	291	82	206	-	3	3	1	-	222	2	-	1	62
Chile	30	0	-	-	-	-	-	-	-	-	-	-	-	-
Cuba	268 390	7	4	2	1	-	-	-	7	-	-	-	-	-
Dominican Republic ...	317 695	229	229	-	-	-	23	-	148	2	-	5	-	51
Grenada and Carriacou	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Guyana	8 308	4	4	-	-	-	-	-	2	-	-	-	-	2
Jamaica	23 579	1	1	-	-	-	-	-	1	-	-	-	-	-
Peru	67 242	177	1	175	1	-	122	3	3	29	-	-	1	19
Trinidad and Tobago ..	...	1	1	-	-	-	-	-	1	-	-	-	-	-
United States of America[b]	190	260[b]	68	134	18	2	-	-	252	-	4	3	-	1
Venezuela	142 745	1 817	911	888	0	18	673	1	54	576	1	512	-	-
Dominica	...	...	...	...	...	...	...	...	...	...	...	...	...	...
French Guiana	2 769	214	212	2	-	-	171	-	2	25	-	1	9	6
Guadeloupe	...	-	-	-	-	-	-	-	-	-	-	-	-	-
Puerto Rico	...	1	-	1	-	-	-	-	1	-	-	-	-	-
St. Lucia	2	0	-	-	-	-	-	-	-	-	-	-	-	-
Surinam	7 644	20	20	-	-	-	-	-	-	15	-	-	-	5
Total	921 927	3 055	1 533	1 441	20	23	994	8	479	875	7	530	14	148

a) Cases imported from Attack, and/or Consolidation phase areas. b) Includes 8 cases P.ovale and 30 with undetermined infection.

Table 8

EPIDEMIOLOGICAL EVALUATION IN AREAS IN CONSOLIDATION PHASE IN MALARIA ERADICATION PROGRAMS, 1974

Country or other political or administrative unit	Population (thousands)	No. of slides examined	Total No. of positive cases	IPA Total (a)	IPA Local (b)	Species of parasite				Origin of infections							
						P. falciparum	P. vivax	P. malariae	Mixed infections	Autochthonous	Relapsing	Imported		Induced	Introduced	Cryptic	Unclassified or not investigated
												from abroad	from areas within country				
Argentina	194	31 327	138	0.7	0.4	-	138	-	-	45	5	26	1	-	8	6	47
Bolivia	1 052	20 001	260	0.2	0.2	3	257	-	-	128	-	1	26	-	-	-	105
Brazil	14 889																
Colombia	9 630	210 847	3 404	0.4	0.1	1 425	1 951	-	28	487	7	35	2 390	5	11	162	307
Costa Rica	437	81 408	51	0.1	0.05	9	42	-	-	17	-	29	2	-	3	-	-
Dominican Republic	35	8 072	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	1 697	122 979	294	0.2	0.1	17	277	-	-	125	-	-	142	1	1	-	25
Guyana	49	34 241	68	1.4	0.8	63	5	-	-	41	1	26	-	-	-	-	-
Honduras	484	21 790	120	0.2	0.1	2	118	-	-	15	-	2	19	-	-	-	84
Mexico	13 347	431 325	858	0.1	0.03	-	853	5	-	385	61	1	252	7	-	5	147
Panama	418	79 989	3	0.0	-	-	3	-	-	1	-	1	1	-	-	-	-
Paraguay	1 174	54 424	1	0.0	0.0	-	1	-	-	-	-	-	-	-	-	-	1
Peru	2 581																
Belize	79	8 480	29	0.4	0.3	-	29	-	-	21	-	3	2	-	2	-	1
Canal Zone	48	29 082	2	0.0	0.0	1	1	-	-	-	-	2	-	-	-	-	-
French Guiana	19	2 130	83	4.4	4.1	83	-	-	-	72	-	3	3	-	2	-	3
Surinam	45	21 737	181	4.0	1.3	181	-	-	-	6	-	2	40	-	47	-	86
Total	46 178	1 784 068	8 377	0.2	0.1	2 007	6 321	9	40	2 010	71	105	3 608	19	82	172	2 310

a) Estimated on the total number of cases found in the area, by 1,000 inhabitants. b) Estimated on the classified autochthonous, introduced, and estimated number of autochthonous among the non-investigated cases, by 1,000 inhabitants.

Table 9

EPIDEMIOLOGICAL EVALUATION OPERATIONS IN AREAS IN ATTACK PHASE, 1974

Country or other political or administrative unit	Slides examined			Species found			
	Total	Positive		P. falciparum	P. vivax	P. malariae	Mixed infections
		Number	Percentage				
Argentina	6 719	118	1.8	-	118	-	-
Bolivia	93 969	4 597	4.9	339	4 251	-	7
Brazil	1 687 989	63 504	3.8	28 807	34 237	81	379
Colombia	191 587	18 908	9.9	8 719	10 115	4	70
Costa Rica	72 864	71	0.1	7	62	-	2
Dominican Republic	35 006	291	0.8	291	-	-	-
Ecuador	191 269	5 177	2.7	974	4 184	8	11
El Salvador	446 466	65 297	14.6	12 615	52 322	-	360
Guatemala	416 954	3 877	0.9	25	3 852	-	-
Haiti	357 546	25 441	7.1	25 441	-	-	-
Honduras	264 940	7 353	2.8	142	7 205	-	6
Mexico	1 371 139	25 836	1.9	56	25 770	9	1
Nicaragua	233 941	12 167	5.2	1 405	10 715	-	47
Panama	288 831	1 181	0.4	446	700	-	35
Paraguay	68 359	98	0.1	6	92	-	-
Peru	117 675	10 199	8.7	-	10 183	16	-
Venezuela	96 510	5 610	5.8	1 118	4 441	3	48
Belize	14 620	67	0.5	67	-	-	-
French Guiana	4 254	54	1.3	48	6	-	-
Surinam	47 949	3 740	7.8	3 739	1	-	-
Total	6 008 587	253 586	4.2	84 245	168 254	121	966

Table 10

EPIDEMIOLOGICAL EVALUATION OPERATIONS IN NON-MALARIOUS AREAS, 1974

Country or other political or administrative unit	Slides examined			Species found			
	Total	Positive		P.falciparum	P.vivax	P.malariae	Mixed infections
		Number	Percentage				
Bolivia	835	79	9.5	-	78	1	-
Brazil	39 869	1 792	4.5	481	1 295	6	10
Colombia	1 686	94	5.6	32	61	-	1
Costa Rica	384	30	7.8	3	27	-	-
Cuba	175 976	31	0.02	19	8	4	-
Dominican Republic .	9	9	-	-	-	-	-
Ecuador	437	10	2.3	1	9	-	-
El Salvador	32 087	1 394	4.3	154	1 236	-	4
Guatemala	4 286	153	3.6	-	153	-	-
Honduras	1 112	30	2.7	-	30	-	-
Mexico	19 843	106	0.5	-	95	11	-
Paraguay	2 020	2	0.1	-	2	-	-
Venezuela	1 292	221	17.1	14	206	1	-
Surinam	2 909	43	1.5	42	1	-	-
Total	282 745	3 985	1.4	746	3 201	23	15

Table 11

REGISTERED DEATHS FROM MALARIA BY YEAR, 1969-1973

Country or other political or administrative unit	Number of deaths from malaria					Malaria deaths as a % of all deaths					Malaria deaths per 100 000 inhabitants				
	1969	1970	1971	1972	1973	1969	1970	1971	1972	1973	1969	1970	1971	1972	1973
Argentina	0	1	...	...	...	-	0.00	...	...	-	-	0.0	...	...	...
Bolivia	...[a]	...[b]	...[c]	...[d]	...	...[a]	...[b]	...[c]	...[d]	...	...[a]	...[b]	...[c]	...[d]	...
Brazil	40[a]	74[b]	80[c]	19[d]	...	0.04[a]	0.08[b]	0.09[c]	0.04[d]	-	0.4[a]	0.8[b]	1.0[c]	0.4[d]	...
Canada	0	1	0	0	...	-	0.00	-	-	-	-	0.0	-	-	-
Colombia	930	604	698	814	-	0.60	0.45	0.50	0.51	-	4.5	2.9	3.2	3.6	-
Costa Rica	2	1	3	1	1	0.02	0.01	0.03	0.01	0.01	0.1	0.1	0.2	0.1	0.1
Dominican Republic	2	3	2	1	...	0.01	0.01	0.01	0.00	...	0.1	0.1	0.0	0.0	...
Ecuador	154	97	93	75	-	0.24	0.16	0.15	0.11	-	2.6	1.6	1.5	1.2	-
El Salvador	186	122	92	86	85	0.55	0.35	0.32	0.27	0.39	5.5	3.5	2.6	2.3	2.2
Guatemala	19	20	8	...	...	0.02	0.03	0.01	...	...	0.4	0.4	0.1	...	...
Guyana	0	0	0	...	...	-	-	-	...	...	-	-	-	...	...
Haiti	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Honduras	109	65	58	117	86	0.49	0.32	0.28	0.54	0.41	4.4	2.5	2.2	4.4	3.1
Jamaica	0	1	2	...	...	-	0.01	0.01	...	...	-	0.1	0.1	...	...
Mexico	35	33	38	43	8	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.1	0.1	0.01
Nicaragua	270	254	...	90	135	1.69	1.64	...	1.62	1.15	14.1	12.8	...	4.6	6.6
Panama	24	16	9	9	4	0.25	0.16	0.09	0.10	0.04	1.7	1.1	0.6	0.6	0.3
Paraguay	15	2	4	0	0	0.13	0.02	0.03	-	-	1.3	0.2	0.3	-	-
Peru	38	43	31	26	...	0.04	0.04	0.03	0.04	0.03	0.3	0.3	0.2	0.6	0.5
United States of America	11	5	6	...	...	0.00	0.00	0.00	...	...	0.0	0.0	0.0	...	...
Venezuela	4	8	15	17	9	0.01	0.01	0.02	0.02	0.01	0.0	0.1	0.1	0.2	0.1
Belize	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
French Guiana	0	1	1	...	...	-	0.28	0.24	-	-	-	2.0	2.0	...	-
Puerto Rico	1	0	2	...	...	0.01	-	0.01	...	...	0.0	-	0.1	...	-
Surinam	...	...	1	...	...	-	...	0.04	...	...	...	...	0.2	...	-

a) Data from 18 of the 27 Capital cities. b) Data from 19 of the 27 Capital cities. c) Data from 17 of the 27 Capital cities. d) Data from 7 of the 27 Capital cities.

B. Information by country

ARGENTINA

The malaria situation in Argentina was most favorable in 1970 when transmission was practically interrupted throughout the country except for a few foci in the Provinces of Salta and Jujuy. The number of malaria cases registered for that year was 86. However, the situation deteriorated gradually and in 1973 outbreaks were observed in these two Provinces,719 cases having been recorded. In view of the outbreaks, especially in the frontier region bordering Bolivia, in 1974 the Government intensified its antimalarial activities and increased its collaboration with Bolivia in order to reduce malaria incidence along the frontier. As a result, the number of malaria cases was very much reduced: 171 cases (all P. vivax) were found. In August 1974, a new agreement was signed between the Government and PAHO for an intensification of antimalarial activities. The Government increased its financial support and assigned a full-time malariologist to the program in 1974.

BELIZE

The increase in salaries and subsistence allowances and the rise in the prices of DDT, kerosene, gasoline, and laboratory supplies resulted in a shortage of operating funds for field activites. Of the 10,858 houses planned to be sprayed in the first semester, only 8,400 were sprayed, giving a coverage of 77.4 per cent. In the second cycle, 7,490 houses were sprayed of 11,121 houses planned (67.4 per cent). In addition, 1,942 houses were sprayed during the year in emergency operations. The spraying program was readjusted on a priority basis, taking certain risks in the areas with low levels of endemicity. During the year two small outbreaks were observed in the consolidation-phase area, one being in Orange Walk Town and the other in south Stann Creek. With the application of emergency measures, transmission seemed to have been interrupted. During the year of 1974, 96 malaria cases were detected in 23,100 blood smears examined. All cases were of P. vivax, 76 cases being autochthonous, 11 imported, seven introduced and two cryptic. Two border meetings were held during the year, with Guatemala in February and with Mexico in June.

BOLIVIA

The ME program in Bolivia continued to have financial difficulties during the year. The additional funds given to the program were absorbed by the rise in salaries, leaving no appreciable increase for operating expenses. Shortage of DDT forced a reduction in spraying coverage in the attack-phase area except for Zone VI, where total coverage was achieved through the collaboration of the Argentine Government. In this zone, there was a marked reduction in the number of cases, from 3,266 in 1973 to 1,549 in 1974. In the country as a whole, there were 4,936 cases registered in 1974, comparing favorably to 7,696 in 1973. No technical problems are known to exist and malaria has been responsive to DDT residual house spraying.

BRAZIL

During the first semester of 1974, the malaria situation in the sectors along the coast was evaluated by four assessment teams organized by the technical staff of the Superintendency of Public Health Campaigns (SUCAM) and the PAHO project advisors. The teams recommended transfer of 448 localities with 96,045 inhabitants in nine municipalities from attack to consolidation phase, and suspension of DDT house-spraying in 143 municipalities with 2,491,393 inhabitants as a preliminary step towards their transfer from attack to consolidation phase.

The first spraying cycle was carried out during January-June, with 2,981,190 houses sprayed of the total of 3,652,426 houses planned (coverage 81.6 per cent). The second cycle began in July with 3,161,610 houses planned to be sprayed, 1,478,000 houses being in areas classified as "time-limited malaria eradication" and 1,683,610 houses in "long-term malaria eradication." There was a reduction in the number of houses to be sprayed in the second cycle due to suspension of spraying in some areas where malaria transmission had been interrupted, as evidenced by the epidemiological information collected. During the year 2,271,691 blood smears were examined,among which 66,481 positives were found. Of these positive smears, 8,981 were from the area of "time-limited malaria eradication" and the rest from the "long-term malaria eradication" area which includes the Amazon Basin.

In the city of Porto Velho, larviciding at weekly intervals with FLIT-MLO has been tried since May 9. The larvicide was not completely applied as planned and did not produce the results expected, although there was a slight reduction in the number of cases.

The strategy of this program is to give high priority in the area of "short-term ME" and to extend anti-malaria activities to the area of "long-term ME" when the resources are made available.

COLOMBIA

The program suffered from a 25 per cent reduction in budget in 1973 and the same situation continued in 1974. Field activities were reduced, especially in epidemiological evaluation which was reduced to about 50 per cent of 1973 in terms of blood slides examined. Efforts were focussed on prevention of reinfections or outbreaks in the consolidation-phase area, and to maintaining at a low level malaria incidence in the attack-phase area. The principal problems which have interfered with progress are refusals by the population to permit the attack measures to be applied, especially DDT house spraying; resistance of P. falciparum to chloroquine, and behavioral resistance of the vector to DDT in certain areas. In areas of agricultural colonization, these problems are frequently found, in addition to colonization--specific problems of poor housing, immigration of laborers and an unstable economic and social situation. For these reasons, transmission has been very persistent in the seven areas of colonization, which have a total population of 583,552 or only 4.1 per cent of the total population in the malarious area of the country, but in 1974 had 9,701 malaria cases, representing 43.3 per cent of the total registered in the country. Taking the country as a whole, there were 22,406 malaria cases in 1974, out of 404,120 blood smears examined, comparing favorably to 1973, when 56,494 cases were registered from 631,563 blood smears examined. On March 28 and 29, a border meeting was held in Bogota with the participation of the Ministers of Health of both Colombia and Panama, to discuss a joint antimalaria operation in the border area.

COSTA RICA

The population in the malarious area was estimated at 635,107 as of 1 July 1974. Of this population, 437,172 or 68.8 per cent is in the consolidation-phase area and 197,935 (31.2 per cent) in the attack-phase area. In 1974, a total of 152 cases of malaria was found in 154,656 blood smears examined. Of these cases, 98 were imported from the neighboring countries in Central America, from Panama and Haiti and 35 cases were classified as autochthonous. The 152 cases were distributed among 82 localities, 76 per cent of them being in the northern frontier region. The importation of cases from neighboring countries continued to be the major problem in the program, requiring constant attention to malaria surveillance.

DOMINICAN REPUBLIC

The major activities of the ME program continued to be vigilance and the elimination of foci arising from imported cases. There was no change in program phase during the year, 6 municipalities located along the frontier region with 2,745 Km^2 and 90,236 inhabitants being in the attack phase, two municipalities with 537 Km^2 and 34,533 inhabitants in the consolidation phase, 89 municipalities with 44,281 Km^2 and 4,407,543 inhabitants in the maintenance phase and one municipality with 880 Km^2 and 30,029 inhabitants in non-malarious area. Residual house spraying continued in a part of the area in the attack phase having approximately 6,600 houses with 26,000 inhabitants. In 1974, 520 cases of malaria were found in the country, of which 291 were in the attack-phase area and 229 cases in the maintenance-phase area. The importation of malaria cases remains as the principal problem in the malaria program and constant costly vigilance activities must be maintained. The Malaria Service personnel continued to participate in other health activities in the maintenance and consolidation-phase areas.

ECUADOR

The estimated population in the originally malarious area at 1 July 1974 was 4,002,000, of which 2,305,000 lived in the attack-phase area and the rest in consolidation. The program continued the application of DDT house spraying in the attack-phase area and malaria surveillance in the consolidation area. A total of 183,207 houses was planned to be sprayed during January-June, but only 113,685 (62.1 per cent) were sprayed. Due to shortage of DDT, spraying operations were

suspended from May to August, as the result of a series of difficulties with delivery of the insecticide. From August to December, 120,046 houses were sprayed of the 186,321 planned. The number of malaria cases, however, showed a further reduction in 1974, 5,481 cases having been registered in 314,685 blood smears examined. Since 1969, there has been a steady decline in malaria incidence. In the City of Esmeraldas, an outbreak of P. falciparum was observed. With the collaboration of the municipal government, drainage was introduced to eliminate the breeding places, in addition to barrier house-spraying around the city. Difficulties were observed in field operations in Zone II (the eastern part of the country), where the construction of the Ambato-Puyo highway practically blocked communication between the Zone Office and field units. Shortage of fluvial transportation constitutes a serious problem in field operations in areas where rivers are the only means of communication.

EL SALVADOR

In 1973, the vector in numbers of localities on the western side of the Pacific coast was found to be resistant to propoxur and this resistance seemed to be increasing in extension and intensity. Early in 1974, it was decided to discontinue the application of this insecticide in 69 localities with 23,101 houses and 96,785 inhabitants. In these localities, mass drug administration was introduced on a selective basis, that is to say, to fever cases and to those who desire to take such treatment. Propoxur spraying was continued in 277 localities with 94,071 houses and 438,792 inhabitants on the eastern side of the Pacific coast where the vector is still susceptible. DDT spraying was applied only in 23 localities with 4,427 houses and 22,025 inhabitants, in the area where this insecticide is still effective. Despite these attack measures, the malaria situation in the country has deteriorated considerably. During the year, 478,553 blood smears were examined and 66,691 malaria cases found, while in 1973, 393,110 smears were examined with 35,095 cases. In the present epidemiological situation, no insecticide currently known can be applied effectively in El Salvador. An interministerial plan for malaria control was approved by the Council of Ministers to mobilize the resources of other Ministries, such as those of Defense, Interior, Public Works, Education and Agriculture, for antimalarial activities to be coordinated by the Ministry of Health. At the same time, research activities are being conducted jointly by the Government and PAHO to find effective complementary or alternative attack measures. A border meeting with Guatemala was held in October in Chiquimula, Guatemala.

FRENCH GUIANA

In the attack phase area with 6,000 inhabitants, DDT residual house spray was applied twice a year in addition to the distribution of medicated salt. In the consolidation area (19,000 inhabitants) and the maintenance phase (25,000 inhabitants), passive case detection and radical cure treatment of cases were carried out as routine vigilance measures, and DDT house spraying and medicated salt were also applied as emergency measures in localities where transmission was suspected or proved. In 1974, 9,153 blood smears were examined and 351 cases were found. These positive cases were distributed as follows: 54 in the attack phase, 83 in the consolidation phase and 214 in the maintenance phase areas. The increase in the number of cases in the maintenance phase area was due to an outbreak in the locality of Remire near Cayenne, originated by imported malaria cases. The control of this outbreak has been made difficult by the presence of a high proportion of illegal immigrants who try to avoid contacts with Government officials.

GUATEMALA

The program continued the application of attack measures using propoxur and DDT in residual house spraying. In a limited number of localities mass drug administration was carried out as a complementary measure, 6,365 persons having been included under such treatment on a monthly cycle. Larviciding using fenthion was applied in some localities in the Department of Baja Verapaz, protecting a total population of 19,000. During the first semester, the propoxur spraying program was slightly modified in order to meet epidemiological needs: in 4 municipalities on the Pacific coast, its use was suspended due to the appearance of vector resistance to this insecticide; on the other hand, 4 additional municipalities in the Department of Huehuetenango were added to the fenthion spraying program. Delay in the arrival of DDT caused a slight reduction in the number of houses sprayed with this insecticide during the first cycle of the year. A total of 421,240 blood smears was examined in the country during the year, and 4,030 cases were detected. In 1973, a total of 6,182 cases were found among 386,026 smears examined. During 1974, 25 cases of P. falciparum were identified, all of them being detected in the frontier region bordering El Salvador. In 1973, only two cases of P. falciparum were recorded in the country. Since the application of propoxur in the coastal area in 1971, the number of malaria cases has shown a steady decrease. However, the problem of vector resistance to propoxur requires serious attention.

GUYANA

Guyana maintained malaria surveillance activities in the consolidation-phase area and epidemiological vigilance in the maintenance-phase area. DDT spraying was applied only in the frontier region with Brazil, as a preventive measure. During the year, 42,549 blood smears were examined, of which 72 were positive for malaria: two from Grentyne River (bordering Surinam), 68 from Lethem (bordering Brazil) and two from Africa. Financial problems have given rise to considerable difficulty in the rapid carrying-out of epidemiological investigacion activities and application of emergency measures. However, no major outbreak has taken place during the year. A sero-epidemiological survey was carried out in May 1973 and another in May 1974. The results indicated that sporadic malaria transmission might have occurred after 1968 in the localities surveyed, although no malaria cases were detected by the routine surveillance operations. However, there was no serological evidence of malaria transmission between the two survey dates.

HAITI

A plan for expansion of NMES activities in other health programs was implemented during the first semester of the year and the NMES personnel initiated smallpox vaccination and treatment of yaws in February and March. However, due to the seriousness of the malaria problem in the country, it was later decided that the NMES should devote its efforts to antimalaria activities. The epidemiological situation of malaria suffered further deterioration, especially in the central and southern parts of the country. In 1973, 22,858 cases were encountered and in 1974, 25,441 cases were found.

The program planned to spray 600,000 houses twice a year at 2 gm/m^2 but the existing stock of DDT did not permit such coverage. The spraying was readjusted on a priority basis and dosage was reduced to 1 gm/m^2 in some areas. The first spraying cycle covered 246,146 houses and the second, 241,512 houses. Mass drug administration was carried out in selected localities where the vector is resistant to DDT and where the slide positivity rate was over 5 per cent. On the average, 58,404 persons were under monthly treatment with an average coverage of 76.0 per cent. Larviciding with gas-oil and abate continued in a suburban area of Port-au-Prince, in Bois Neuf (80 Km north of Port-au-Prince) as well as in Anse-á-Pitre, a small village in the frontier region. A pilot project with propoxur was initiated in an area of high endemicity with 12,065 houses. The first cycle was carried out during 16 September-29 November and it is planned to repeat every three months for a total of six cycles. Considering the difficulty being experienced in obtaining required insecticides, vector resistance to DDT in certain localities which is tending to increase in intensity and extension, and above all the serious financial problems, it is necessary to plan an effective antimalaria program giving priority to the areas where the majority of malaria cases are being produced.

HONDURAS

The program continued to have difficulties with financial resources; of the 3,451,003 lempiras requested, only 1,509,620 lempiras were approved (43.7 per cent). Attack measures were applied to high priority areas, leaving a large malarious area without protection. The area where the vector is resistant to DDT received spraying with propoxur, but due to shortage of this insecticide, spraying operations were suspended in the middle of April. The rest of the country received DDT spraying only in some selected areas, but in March the stock of this insecticide was also exhausted. During the remainder of the year the regular spraying program was suspended in the country except for emergency spraying. In order to prevent outbreaks, mass drug administration on a limited scale was carried out in some strategic localities in the consolidation-phase area as well as in the area where propoxur had been in use. The number of malaria cases continued to decrease during 1974, due to the residual effect of the insecticides applied before March; a total of 7,503 cases was found in the entire country in 287,842 blood smears examined, while in 1973, 8,862 cases were recorded among 226,231 blood smears examined.

In September, the northern part of the country suffered from a serious flood and the rest of the country from heavy rain. With external financial assistance, insecticides were purchased and emergency measures applied in the affected northern area, but no specific measures were taken in the south, where the potential for malaria transmission is the highest in the country and where propoxur had been being applied because of vector resistance to DDT. During the last quarter of 1974, the malaria situation began to deteriorate, especially in the south.

MEXICO

In 1974, the population in the malarious area totaled 28,092,815 inhabitants, of which 14,745,573 were in the attack-phase area and 13,347,242 in the consolidation-phase area. The malarious area is divided into three principal regions: the Gulf of Mexico and Yucatán Peninsula slope, the southern Pacific slope and the northwestern Pacific slope.

a) In the region of the Gulf of Mexico and the Yucatán Peninsula, with a population of 8,388,922, the vector is susceptible to DDT and since 1971, the area has received special attention from the Malaria Service in anti-malaria activities. Malaria incidence has been maintained at a low level during 1973 and 1974; of the 953,218 blood smears examined in 1974, 981 were found positive for malaria parasites, comparing favorably to 1,377 cases in 1,033,416 smears examined in 1973. Malaria has responded very well to the attack measures applied and the annual parasite incidence in this area in 1974 was 0.12 per 1,000 inhabitants.

b) In the region of the southern Pacific slope, the vector A. pseudopunctipennis shows considerable resistance to DDT, and malaria transmission has been persistent. Apparently, the attack measures applied have not reduced malaria incidence; of the 588,086 blood smears examined in 1974, 15,863 malaria cases were found. However, there has been a marked reduction of P. falciparum infections in the last five years.

c) In the region of the northwestern Pacific slope, the vector is generally susceptible, but in some isolated localities resistance to DDT has been found. The evolution of the program had been favorable, but since 1972 no further progress has been observed due to administrative difficulties, particularly personnel problems. In 1974, 9,956 cases of malaria were reported among 281,003 blood smears examined.

Considering the country as a whole, the malaria situation is somewhat static, except in the region of the Gulf of Mexico and the Yucatán Peninsula, where steady progress has been observed in the last three years.

At the invitation of the Secretary of Health and Welfare, Dr. G. Davidson of the Ross Institute of Tropical Hygiene visited the program during July 24-August 28 to study the problems of insecticide resistance of P. pseudopunctipennis and A. albimanus along the Pacific Coast of the State of Oaxaca. A border meeting with Belize was held in June in Chetumal of the State of Quintana Roo.

NICARAGUA

The entire territory of Nicaragua is considered malarious and is in the attack phase. It is divided into two epidemiological areas, one being the area where the vector is susceptible to DDT (Area A, with 505,158 inhabitants) and the other where the vector is resistant to this insecticide (Area B, with 1,676,114 inhabitants). In Area B, there are several large cities including the capital, where malaria transmission occurs in the outskirts. Due to limitation of financial resources, insecticides were applied partially in both Areas. In 1974, approximately 21,700 houses were sprayed twice with DDT in Area A and in Area B about 120,000 houses were treated with propoxur 4 times during the year. In addition, 3 cities in Area B were protected by larviciding, using fenthion, malathion or diesel oil. During the year of 1974, 233,941 blood smears were examined and 12,167 positives found, while in 1973, 191,361 smears were examined with 4,246 positives. The increase in the extension of vector resistance in Area B has been considered to be the main reason for the rise in malaria incidence.

PANAMA

The Government announced the transfer of an area of 16,231 km^2 with 417,965 inhabitants from attack to consolidation phase, which had been recommended in the evaluation of the program carried out in November, 1973. The outbreak in the Comarca de San Blas was brought under control early in 1974, by using propoxur, as the local strain of A. albimanus was found to be resistant to DDT. Resistant of the local strain of P.falciparum to chloroquine was also proven in this area. The outbreak was responsible for 716 cases during the second semester of 1973,and for 854 cases or 72.1 per cent of the total of 1,184 cases detected in the country in 1974.Outside of San Blas, cases were concentrated in two provinces. Bocas del Toro which produced 127 cases, and Darien, 106 cases in 1974. The rest of the country accounted for 97 cases, most of which

were imported from these three foci. Efforts are being continued to eliminate the remaining sources of infection in the Comarca de San Blas, Bocas del Toro and Darien. In an area bordering Costa Rica, A. albimanus was found resistant to DDT, but it has no major epidemiological significance, as transmission in that area has been interrupted. For the first time in history, the Canal Zone registered no cases of malaria in 12 consecutive months, from August 1973 to August 1974. A meeting of the Ministers of Health of Panama and Colombia was held in Bogotá late in March to discuss common problems and the coordination of antimalarial activities in frontier zones.

PARAGUAY

The program still maintained an area with 904,000 inhabitants in the attack phase, but malaria transmission has been practically interrupted in the whole of the country. However, due to the risk of importation of cases, DDT house spraying was carried out as a preventive measure in those areas with high receptivity and vulnerability. In the consolidation-phase area with 1,170,285 inhabitants there was only one case reported. Most of the imported cases were detected rapidly and occasional foci of transmission were eliminated in good time. At the beginning of the year, a plan for the "coordination of General Health Services with the Malaria Service at the level of health posts" was elaborated. Following this plan, training courses were organized to give the necessary orientation in malaria vigilance to the general health service staff and on health activities to the malaria service personnel. The malaria personnel have already participated in vaccination programs in the frontier areas where there are no health posts. In 1974, 101 cases of malaria were found in the country in 124,803 blood smears examined. Of these cases, 98 were from the attack-phase area, one from the consolidation-phase area and two from the non-malarious areas. Except for 21 authochtonous, one relapsed and one cryptic case in the attack-phase area, all were imported.

PERU

The ME program of Peru was reviewed by a multidisciplinary team, composed of national and international staff, during 2-24 May. The team concluded that the program had suffered from a series of administrative, financial and operational difficulties since 1969 and as a result, the malaria situation had deteriorated considerably. The team recommended changes in the structure, methods and administrative and technical procedures of the NMES, plus provision of the financial resources necessary to carry out adequate field operations. To facilitate the change of structure, the team recommended assignment of a special commission. The recommendation was accepted and the commission was formed in June to implement the revision of the NMES structure within 60 days.

During the year (1974), a total of 2,109 cases were found in the consolidation-phase area and 10,199 in the attack-phase area. In the maintenance-phase area, a new focus was found in the Valley of Chillón (near Lima), which produced 177 cases. To eliminate this focus, 2.9 million soles were allocated to the NMES in addition to its regular budget. Satisfactory results were obtained with intensified efforts. Shortage of financial resources and of land and fluvial transport continued to be the major problems in the program.

SURINAM

In view of chloroquine resistance in P. falciparum, the distribution of amodiaquinized salt was discontinued in January, 1974. On the Marowijne/Tapanahony/Lawa River, three cycles of mass blood surveys were carried out during March 6-May 5 and cases were treated, first with chloroquine and, later, those suspected of chloroquine resistance with fanasil and pyrimethamine. The first survey detected 139 cases, of which eight were suspected of drug resistance. The second survey found 32 cases with two suspected and the third survey found nine cases of which none was suspected of resistance. House spraying with dieldrin was reinitiated, but the coverage was only 20.4 per cent of the total houses existing in the attack-phase area or 67.0 per cent of the houses visited. On the Surinam River a similar operation was planned, but it was seriously delayed due to shortages of insecticide, means for fluvial transportation and reliable field personnel. In 1974, a total of 80,239 blood smears was examined and 3,984 positives were found. An outbreak of malaria was observed in Moengo in the consolidation-phase area, which produced 49 cases. In January 1974, a border meeting was held in St. Laurent, French Guiana, to discuss coordinated antimalaria activities of French Guiana and Surinam along the Marowijne River.

VENEZUELA

Of the 8,640,000 inhabitants (1974) living in the originally malarious area, 8,123,472 (94.0 per cent) are in the area in the maintenance phase and the rest (6.0 per cent) in the attack phase. The major area in the maintenance phase presents no special problems, but in a small area of some 6,300 km^2 in the easternmost part of the country, transmission has been observed since early in 1973, originating from cases imported from the southern attack-phase area. In the area in the attack phase there are two foci, one being in the western end of the country and the other in the south. Late in 1973, due to a sudden influx of diamond miners into the southern focus, a severe outbreak of malaria was observed. Emergency measures were applied early in 1974 and the focus was almost eliminated by the end of the year. However, sources of infection had spread from this focus before its elimination, causing deterioration in the malaria situation in the attack as well as in the maintenance-phase areas. In April-May, 1974, the program was reviewed by a group of national experts who presented a report on "Malaria in Venezuela and its Future". In October-November 1974, the program was evaluated by an international team organized by PAHO at the request of the Government.

C. Field operations

The application of residual insecticides to houses continued as the principal method for preventing malaria transmission throughout the Region. As shown in Table 12, the number of house-sprayings totaled 14,259,931 in 1974; the number represents a decrease of 16.0 and 19.4 per cent in comparison with 1972 and 1973 respectively. As in the past, DDT was the predominant insecticide used. In areas of vector resistance to DDT in Central America, propoxur was used for 1,103,125 house-sparyings;the number decreased because of either lack of supplies due to increasing cost of the pesticide or to its reduced effectiveness as a result of increasing areas of vector resistance to propoxur. Other supplementary or alternative attack measures included treatment of confirmed cases of malaria in all programs; distribution of drugs in foci of persisting transmission in Haiti and some countries in Central America; limited use of propoxur in Haiti and Venezuela; and larviciding of foci in Brazil, the Dominican Republic, Ecuador, Guatemala, Haiti, Mexico and Nicaragua.

Reductions in house-sprayings during the past two years have resulted from conversion of areas of attack to consolidation in some countries and from limited financial resources which restricted field operations in others. Despite the increase in areas of vector resistance and problems associated with shortages of supplies and equipment, the epidemiological situation improved or remained stable in 13 of the 20 countries in the Region having areas under attack measures.

The quantities of the various types of insecticides which were used in malaria eradication operations in the Region during 1974, and the estimated quantities for 1975, are shown in Table 13.

As shown in Table 14, a total of 8,997,318 blood smears was examined, of which 269,003 were positive; of these, passive case detection contributed 40.7 per cent of the blood smears and 73.8 per cent of the cases of malaria in the Region.

Personnel employed in malaria programs by country and by category are shown in Tables 15 to 19. At the end of 1974 there were 27,848 full-time employees. Table 20 provides data on the type, number and condition of transport equipment available in each country; the high percentage of vehicles reported as being in poor condition is indicative of budgetary, logistical and operational problems being experienced by several programs.

D. Coordination of activities of malaria eradication programs and general health services

Inherent in considerations for the establishment of categorical programs for the eradication of malaria by countries of the Hemisphere, was the understanding that with the accomplishment of the objective the human and financial resources of National Malaria Eradication Services (NMES), would be absorbed or integrated into programs of the General Health Services (GHS). While it was acknowledged that premature integration of activities or assignment of additional responsibilities to the NMES could have an adverse effect on the eradication effort, it was recognized that progression from consolidation to maintenance would be accompanied by the gradual assumption of full responsibility by the GHS for the surveillance of malaria. In countries of the Region that have achieved eradication, full integration of the NMES and the GHS has occurred and effective malaria surveillance programs are being conducted. Also surveillance programs are conducted in coordination with the GHS in the eight programs of the Region that have areas in the maintenance-phase (Argentina, Brazil, Dominican Republic, Guyana, Peru, Venezuela, French Guiana and Surinam).

PAHO/WHO is continuing to work with the countries in developing efficient programs of malaria surveillance and in planning for the eventual integration of the NMES with the GHS. Within this context, however, a modification in the above concepts has gradually evolved during the last few years, whereby an increasing number of countries are assigning to the NMES responsibility for conduct of additional public health programs. Factors contributing to this trend include failure to achieve eradication in a time-limited period, reductions in external financial assistance and need to attack other public health problems. For example, the complexity of operational, logistic, technical and financial problems has limited the rate of progress of programs in Colombia, El Salvador, Haiti and other countries. The NMES of Colombia has been delegated responsibility for eradicating Aedes aegypti, conducting immunization programs, and controlling yaws and leprosy. Additional public health responsibilities have been assigned to the Malaria Services of Haiti and El Salvador, but plans for implementation of specific programs there are in the developmental stage.

Costa Rica, the Dominican Republic and Paraguay may be cited as examples of countries that have made considerable progress towards eradication. They have developed effective programs of malaria surveillance and are currently implementing programs for improvement of health in rural areas. Several other countries have assigned additional responsibilities to the NMES and plans for implementing these health programs are either in development or, as in Ecuador, pilot projects have been established which are designed to develop methodologies applicable to local conditions.

The modification in initial concepts which has resulted in assignment of additional health responsibilities to the NMES has necessitated a reappraisal of current training programs and an evaluation of requirements to train PAHO/WHO and national NMES personnel in methods for the prevention and control of diseases other than malaria. Plans are being developed to meet these requirementes.

Table 12

HOUSES SPRAYED WITH RESIDUAL INSECTICIDES,[a] BY COUNTRY AND BY CYCLE, 1974

Country or other political or administrative unit	1st Cycle			2nd Cycle			3rd Cycle			4th Cycle			Total sprayings
	Houses planned	Houses sprayed	% sprayed	Houses planned	Houses sprayed	% sprayed	Houses planned	Houses sprayed	% sprayed	Houses planned	Houses sprayed	% sprayed	
Argentina[b]	...	15 103	-	...	20 053	-	-	-	-	-	-	-	35 156
Bolivia	40 389	39 010	96.6	40 323	39 596	98.2	-	-	-	-	-	-	86 477[c]
Brazil	3 660 099	2 981 190	81.5	3 688 290	2 730 204	74.0	-	-	-	-	-	-	5 711 394
Colombia (Semestrial)	309 463	270 753	87.5	367 002	262 579	85.5	-	-	-	-	-	-	533 332
(Annual cycle)	139 011	107 593	77.4	-	-	-	-	-	-	-	-	-	107 593
(Emergency cycles)	-	32 590	-	-	25 165	-	-	-	-	-	-	-	57 755
Costa Rica (Semestrial)	31 725	31 552	99.5	31 299	31 162	99.6	-	-	-	-	-	-	62 714
(Quarterly, propoxur)	1 728	1 769	102.4	5 079	5 146	101.3	5 231	3 718	71.7	2 306	2 282	99.0	12 915
Dominican Republic	5 927	5 686	95.9	6 648	5 792	87.1	-	-	-	-	-	-	11 478
Ecuador (Semestrial)	183 207	113 685	62.1	186 321	120 046	64.4	-	-	-	-	-	-	233 731
(Annual cycle)[d]	159 590	68 594	43.0	-	-	-	-	-	-	-	-	-	68 594
El Salvador (Semestrial)	4 447	3 525	79.3	4 447	538	12.1	-	-	-	-	-	-	4 063
(Quarterly, propoxur)	67 027	62 096	92.6	67 027	29 601	44.2	94 071	87 168	92.7	94 071	86 775	92.2	265 640[e]
Guatemala (Semestrial)	140 021	110 620	79.0	141 699	111 939	79.0	-	-	-	-	-	-	222 559
(4-Months cycles DDT)	6 772	6 708	99.1	4 154	4 615	111.1	4 208	4 124	98.0	-	-	-	15 447
(Quarterly, propoxur)	102 990	89 816	87.2	102 222	97 899	95.8	100 813	79 342	78.7	81 874	78 512	95.9	345 569
Guyana	2 192	393	17.9	2 192	1 146	52.3	-	-	-	-	-	-	2 676[f]
Haiti	250 979	246 146[g]	98.1	255 778	241 512	94.4	-	-	-	-	-	-	487 658
Honduras (Semestrial)	142 404	58 103	40.8	-	-	-	-	-	-	-	-	-	58 103
(One cycle, propoxur)	36 740	28 523	77.6	-	-	-	-	-	-	-	-	-	28 523
(8-Weeks cycles, propoxur)	3 565	3 359	94.2	3 559	1 024	15.6	-	-	-	-	-	-	4 383
Mexico (Semestrial, attack)	1 993 854	1 965 774	98.6	1 512 700	1 962 089	129.7	-	-	-	-	-	-	3 927 863
(Semestrial, Consolid.)	90 211	90 744	100.6	70 398	94 061	133.6	-	-	-	-	-	-	184 805
(4-Months cycles)	60 739	60 078	10.0	61 355	60 447	98.5	62 799	60 072	95.7	-	-	-	180 597
Nicaragua (Semestrial)	21 214	19 404	91.5	22 117	19 939	90.2	-	-	-	-	-	-	39 343
(Quarterly, propoxur)	109 198	99 848	91.4	109 809	101 786	92.7	114 161	106 927	93.7	124 544	115 487	92.7	424 048
Panama (Semestrial)	76 867	71 502	93.0	72 809	68 709	94.4	-	-	-	-	-	-	140 211
(Annual cycle, DDT)	18 648	18 652	100.0	-	-	-	-	-	-	-	-	-	18 652
(Quarterly, propoxur)	4 613	4 121	89.3	6 069	5 965	98.3	6 307	5 962	94.5	6 314	5 999	95.0	22 047
Paraguay (Semestrial)	78 035	76 711	98.3	78 418	75 228	95.9	-	-	-	-	-	-	151 939
(4-Months cycles)	1 505	2 079[h]	138.1	1 672	1 884[h]	112.7	1 672	955	57.1	-	-	-	4 918
Peru	196 135	185 785[h]	94.7	195 242	197 620[h]	101.2	-	-	-	-	-	-	383 405[h]
Venezuela (Semestrial)	138 594	129 935	93.8	133 018	124 787	93.8	-	-	-	-	-	-	254 722
(4-Months cycles)	20 812	18 406	88.4	21 528	21 528	100.0	21 113	18 697	88.6	-	-	-	58 631
(Quarterly cycles)	23 753	23 088	97.2	23 445	23 650	100.9	24 618	24 235	98.4	24 131	22 967	95.2	93.940
Belize	10 858	8 400	77.4	11 121	7 490	67.4	-	-	-	-	-	-	15 890
French Guiana	2 000	1 560	78.0	2 000	1 600	80.0	-	-	-	-	-	-	3 160
Surinam	19 504	10 096	51.8	-	-	-	-	-	-	-	-	-	10.096
Total	8 154 816	7 062 997	86.6	7 167 741	6 494 800	90.6	434 993	391 200	89.9	333 240	312 022	93.6	14 270 027

a) DDT semestrial sprayings unless otherwise indicated. b) Emergency sprayings in Consolidation and Maintenance phase areas. c) Includes 7,871 emergency sprayings. d) Annual cycle started in October. e) In addition, 134,803 houses were partially sprayed with propoxur. f) Includes 1,137 houses sprayed once-a-year. g) Includes spraying in Valle de Sula. h) Includes houses sprayed in Consolidation phase areas.

Table 13

INSECTICIDES USED IN THE MALARIA ERADICATION PROGRAMS

Country of other political or administrative unit	DDT (kg.)				Propoxur (kg.) [a]		Other	
	1974		1975		1974	1975 (Est.)	1974	1975 (Est.)
	100%	75%	100%	75%				
Argentina	2 533	18 247	2 500	25 000	-	-	-	-
Bolivia	45	57 420	470	93 657	-	-	-	-
Brazil	210 581	3 295 642	-	4 000 000	-	-	-	-
Colombia	688	384 281	3 500	410 734	-	-	3 927 [b]	4 500 [b]
Costa Rica	3 777	44 407	3 520	42 412	5 489	2 000	-	-
Dominican Republic	1 475	11 315	3 000	12 000	-	-	-	-
Ecuador	-	193 756	-	409 300	-	-	-	-
El Salvador	-	5 367	-	11 362	219 044	269 302	-	-
Guatemala	-	125 009	-	119 515	81 022	93 093	340 [c]	340 [c]
Guyana	-	840	900	3 200	-	-	-	-
Haiti	-	195 418	-	228 000	2 410 [d]	4 222 [d]	-	-
Honduras	416 [e]	28 040 [e]	3 500	170 000	16 026 [d]	88 000 [d]	-	-
Mexico	42 497 [e]	2 286 463 [e]	62 000	2 800 000	-	-	15 [f]	-
Nicaragua	259	18 555	1 000	30 000	161 883	180 000	-	-
Panama	14 260	82 576	9 280	79 605	11 701	16 108	-	-
Paraguay	-	110 000	-	110 000	-	-	-	-
Peru	-	223 817	-	280 000	-	-	-	-
Venezuela	18 194	261 267	7 200	420 400	-	-	64 138 [g]	69 650 [h]
Belize	2 116	7 632	3 523	12 487	-	-	-	-
French Guiana	-	-	3 000	7 500	-	-	-	-
Surinam	...	...	...	...	-	-	-	-

a) Propoxur 50%, unless otherwise indicated. b) kg. of BHC. c) Liters of Fenthion 50%. d) Also 144 kg. Propoxur 20% was used in 1974, and 1,200 kg. will be used in 1975. e) Information up to October. f) Liters of Baytex 50%. g) Includes 46,134 Lts. DDT, C.E, 30% and 18,000 Lts. Baytex 95%. h) Includes 41,100 Lts. DDT. C.E, 30% and 28,550 Lts. Baytex, 95%.

Table 14

COMPARATIVE RESULTS OF ACTIVE AND PASSIVE CASE DETECTION IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1974

Country or other political or administrative	Average number of evaluators	Active case detection			Passive case detection						Total	
		Blood slides			Average number of notification posts	Average of notification post producing slides per month	Blood slides			Average of slides per month per productive notification post	Blood slides	
		Examined	Positive	Percent			Examined	Positive	Percent		Examined	Positive
Argentina	127	59 878	107	0.2	...	179	11 290	64	0.6	5.3	71 168	171
Bolivia	92	95 674	2 360	2.5	2 801	341	19 131	2 576	13.5	4.7	114 805	4 936
Brazil	4 075	1 670 029	21 511	1.3	26 233	10 619	601 662	44 970	7.5	4.7	2271 691	66 481
Chile	-	-	-	-	-	-	30	0	-	-	30	0
Colombia	434	206 881	7 930	3.8	7 280	4 085	197 239	14 476	7.3	4.0	404 120	22 406
Costa Rica	116	151 142	85	0.1	1 232	98	3 514	67	1.9	3.0	154 656	152
Cuba	...	54 366	0	-	...	...	390 000	38	0.01	...	444 366	38
Dominican Republic	138	35 709	271	0.8	4 651	1 613	325 073	249	0.1	16.8	360 782	520
Ecuador	103	119 913	728	0.6	5 499	2 766	194 772	4 753	2.4	5.9	314 685	5 481
El Salvador	89	35 231	5 252	14.9	2 554	2 169	443 322	61 439	13.9	17.0	478 553	66 691
Guatemala	136	226 620	1 263	0.6	5 499	2 528	194 620	2 767	1.4	6.4	421 240	4 030
Guyana	11	34 212	68	0.2	264	...	8 337	4	0.05	...	42 549	72
Haiti	59	121 022	4 645	3.8	...	3 532	236 524	20 796	8.8	5.6	357 546	25 441
Honduras	38	115 652	1 037	0.9	2 998	1 624	172 190	6 466	3.8	8.8	287 842	7 503
Jamaica	...	23 539	0	-	...	...	40	1	2.5	...	23 579	1
Mexico	698	1 482 381	12 029	0.8	58 699	5 601	339 926	14 771	4.3	5.1	1822 307	26 800
Nicaragua	117	50 011	1 775	3.5	3 663	1 953	183 930	10 392	5.6	7.9	233 941	12 167
Panama	234	335 695	1 027	0.3	1 231	399	33 125	157	0.5	6.9	368 820	1 184
Paraguay	...	57 342	45	0.1	5 007	1 231	67 461	56	0.1	4.6	124 803	101
Peru	698	196 610	4 464	2.3	5 839	1 395	120 912	8 021	6.6	7.2	317 522	12 485
United States of America	-	-	-	-	-	-	190	260	-	-	190	260
Trinidad and Tobago	-	-	-	-	-	-	...	1	-	-	...	1
Venezuela	405	170 823	3 951	2.3	2 352	425	69 724	3 697	5.3	13.7	240 547	7 648
Belize	12	19 730	49	0.2	143	36	3 370	47	1.4	7.8	23 100	96
Canal Zone	...	643	0	-	...	...	28 439	2	0.01	-	29 082	2
Dominica	-	-	-	-	...	...	...	...	-	-	...	...
French Guiana	...	8 012	122	1.5	...	...	1 141	229	20.1	-	9 153	351
Grenada	-	-	-	-	...	...	...	...	-	-	...	...
Guadeloupe	-	-	-	-	...	...	...	...	-	-	...	...
Puerto Rico	-	-	-	-	...	...	...	1	-	-	...	1
St. Lucia	-	-	-	-	...	...	2	0	-	-	2	0
Surinam	26	63 880	1 856	2.9	...	...	16 359	2 128	13.0	...	80 239	3 984
Total	-	5 334 995	70 575	1.3	-	-	3 662 323	198 428	5.4	-	8 997 318	269 003

Table 15

PERSONNEL EMPLOYED IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS
31 DECEMBER 1973 AND 1974, BY CATEGORY

(Part-time personnel in parentheses)

	Title	1973	1974
SPRAYING OPERATIONS	Engineers	107 (1)	112 (1)
	Spraying Chiefs	304 (2)	314 (2)
	Sector Chiefs	647	580
	Squad Chiefs	2 861 (32)	2 538 (38)
	Spraymen	11 942 (112)	10 449 (123)
	Draftsmen	125	104
	SUB-TOTAL	15 986 (147)	14 097 (164)[a]
EPIDEMIOLOGICAL EVALUATION	Physicians	215 (2)	194 (5)
	Entomologists	58 (1)	60 (1)
	Assistant Entomologists	195 (6)	174 (4)
	Statisticians and Statisticians' Assistants	377	413
	Evaluation Inspectors	1 188	1 188
	Evaluators	6 668	7 018
	Microscopists	852 (12)	793 (15)
	SUB-TOTAL	9 553 (21)	9 840 (25)
ADMINISTRATION AND OTHERS	Administrators	63	77
	Administrative Assistants	817	678
	Accountants	48	42
	Disbursing Officers	56	69
	Storekeepers	96	82
	Storekeepers' Assistants	99	75
	Secretaries	231	244
	Others	549	714
	SUB-TOTAL	1 959	1 981
TRANSPORT	Transport Chiefs, Mechanics and Assistant Mechanics	536	481
	Drivers	1 117 (2)	979 (2)
	Motorboat Operators	379 (2)	353 (2)
	Boatmen	66	117
	SUB-TOTAL	2 098 (4)	1 930 (4)
	GRAND-TOTAL	29 596 (172)	27 848 (193)

a) In some programs this personnel performs epidemiological activities.

Table 16

PERSONNEL EMPLOYED IN SPRAYING OPERATIONS IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1974

(Part-time personnel in parentheses)

Country or other political or administrative unit	Total	Engineers	Sanitarians or Spraying Chiefs	Sector Chiefs	Squad Chiefs	Spraymen	Draftsmen
Argentina	61	2	6	5	10	38	-
Bolivia	49(149)	-	7	24	1(38)	16(111)	1
Brazil	5 727	33	77	4	821	4 768	24
Colombia	731	10	42	43	193	427	16
Costa Rica	80	-	3	9	12	55	1
Dominican Republic	15	1	-	-	3	10	1
Ecuador	617	3	6	45	113	449	1
El Salvador	233	1	4	8	38	180[c]	2
Guatemala	502	1	1	36	82	378	4
Guyana	9(2)	-	1	-	1	7 (2)	-
Haiti	57	2	1	22	6	24	2
Honduras	205	-	1	8	38	158	-
Mexico	4 106	50	118	232[a]	939[b]	2 732[b]	35
Nicaragua.....	309	1	5	22	50	228[c]	3
Panama	300	-	2	26	43	227	2
Paraguay	151	1	9	21	22	94	4
Peru	362	3	24	33	52	245	5
Venezuela	453	4	-	35	90	322	2
Belize	15	-	-	1	3	11	-
Canal Zone	(13)	(1)	(2)	-	-	(10)	-
French Guiana	68	-	3	-	17	48	-
Surinam.....	47	-	4	6	4	32	1
Total	14 097(164)	112(1)	314(2)	580	2 538 (38)	10 449(123)	104

a) Includes personnel with same category from Epidemiological Evaluation Operations. b) Includes brigade auxiliaries and instructors. c) Includes personnel from the larviciding program.

Table 17

PERSONNEL EMPLOYED IN EPIDEMIOLOGICAL EVALUATION OPERATIONS IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1974

(Part-time personnel in parentheses)

Country or other political or administrative unit	Total	Physicians	Entomologists	Assistant Entomologists	Statisticians and Statisticians' Assistants	Evaluation Inspectors	Evaluators	Microscopists and laboratory personnel
Argentina	229	3	1	2	4	23	175	21
Bolivia	147	8	-	1	7	6	111	14
Brazil	4 607	37	13	35	253	831[a]	3 166[b]	272
Colombia	568	15	6	17	3	87	411[b]	29
Costa Rica	126	-	2	2	-	14	95	13
Dominican Republic	230	1	1	3	4	26	162	33
Ecuador	182	13	1	4	4	-	133	27
El Salvador	204 (4)	1 (4)	1	13	6	28	129	26
Guatemala	195	2	1	11	10	3[b]	140[b]	28
Guyana	53 (3)	1	-	-	13	6	32	1 (3)
Haiti	365	10	1	12	10	8[b]	291[b]	33
Honduras	87	1	-	8	6	8	39	25
Mexico	1 377	68	18	16	18	48	1 069[b]	140
Nicaragua	165	4	1	10	15	1	116	18
Panama	213	2	1	6	9	20	155	20
Paraguay	209	5	2	8[d]	13	-	167[c]	14
Peru	302	8	8	7	27	-	226[b]	26
Venezuela	509	12	2	16	9	71	356	43
Belize	13 (1)	1	-	(1)	-	1	9	2
Canal Zone	(17)	(1)	(1)	(3)	-	-	-	(12)
French Guiana	17	1	1	3	-	4[b]	6[b]	2
Surinam	42	1	-	-	2	3	30	6
Total	9 840 (25)	194 (5)	60 (1)	174 (4)	413	1 188	7 018	793 (15)

a) Personnel performing also spraying operations activities. b) Includes personnel with same category from mass drug treatment program. c) Includes 10 evaluation inspectors. d) Includes 3 from A. aegypti program.

Table 18

PERSONNEL EMPLOYED IN ADMINISTRATIVE AND OTHER SERVICES IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1974

(Part-time personnel in parentheses)

Country or other political or administrative unit	Total	Administrators	Administrative assistants	Accountants	Disbursing Officers	Storekeepers	Storekeepers' Assistants	Secretaries	Other
Argentina	82	1	33	-	-	7	-	2	39
Bolivia	31	6	-	2	1	1	2	9	10
Brazil	138	8	105	1	8	8	8	-	-
Colombia	311	18	20	1	20	18	2	98	134
Costa Rica	49	1	-	3	-	2	3	2	38
Dominican Republic	49	1	4	1	-	1	3	2	37
Ecuador	79	4	3	2	7	4	1	31	27
El Salvador	28	-	-	-	1	1	-	5	21a)
Guatemala	49	1	7	2	5	3	1	5	25
Guyana	3	-	-	-	-	-	2	1	-
Haiti	70	4	1	2	1	4	-	10	48
Honduras	49	1	5	2	-	2	1	4	34
Mexico	599	19	366	8	15	15	19	21	136a)
Nicaragua	129	5	1	4	10	2	4	11	92
Panama	63	2	20	8	-	2	2	9	20
Paraguay	105	1	69	1	1	3	10	11	9
Peru	123	3	40	5	-	5	13	17	40
Venezuela	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Belize	5	1	-	-	-	-	-	2	2
French Guiana	6	-	1	-	-	1	-	3	1
Surinam	13	1	3	-	-	3	4	1	1
Total	1 981	77	678	42	69	82	75	244	714

a) Includes health educators. b) Services performed by the "Direccion de Malariologia y Saneamiento Ambiental" in charge of different programs of environmental sanitation.

Table 19

PERSONNEL EMPLOYED IN TRANSPORT SERVICES IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1974

(Part-time personnel in parentheses)

Country or other political or administrative unit	Total	Transport Chiefs, mechanics and assistant mechanics	Drivers	Motorboat operators	Boatmen
Argentina	53	22	30	1	-
Bolivia	40	9	25	6	-
Brazil	696	19	569	108	-
Colombia	297	117	62	111	7
Costa Rica	21	10	11	-	-
Dominican Republic	30	14	16	-	-
Ecuador	70	10	4	13	43
El Salvador	45	-	45	-	-
Guatemala	54	19	34	1	-
Guyana	20	1	8	6	5
Haiti	38	14	11	2	11
Honduras	35	14	20	1	-
Mexico	248	159	33	40	16
Nicaragua	68	11	47	10	-
Panama	19	14	3	2	-
Paraguay	50	20	25	-	5
Peru	60	20	18	22	-
Venezuela	(a)	(a)	(a)	(a)	(a)
Belize	2	2	-	-	-
Canal Zone	(4)	-	(2)	(2)	-
French Guiana	26	2	11	3	10
Surinam	58	4	7	27	20
Total	1 930 (4)	481	979 (2)	353 (2)	117

a) Services performed by personnel of the "Direccion de Malariología y Saneamiento Ambiental" in charge of different programs of environmental sanitation.

Table 20

MEANS OF TRANSPORT IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1974

Country or other political or administrative unit	Trucks (3 tons or more)		Trucks and "Pick-up" (less than 3 tons)		Jeeps		Automobiles and station wagons		Motorcycles		Bicycles		Motor boats		Boats without motor		Saddle and pack animals	Other	
	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b		a	b
Argentina	1	3	45	15	20	30	2	4	-	-	8	2	1	2	-	-	-	-	-[c]
Bolivia	-	-	8	7	15	24	2	-	8	7	-	-	15	10	-	-	70	16	35[c]
Brazil	33	-	280	-	730	-	8	-	-	6	487	-	314	-	7	-	1 336	-	-
Colombia	13	3	59	68	117	60	40	9	15	7	152	64	193	36	39	-	1 225	140	18
Costa Rica	1	-	11	-	35	-	2	-	30[e]	4[e]	30	36	22	-	-	-	40	-	-
Dominican Republic	1	-	41	11	2	-	6	-	138[e]	5[e]	-	-	-	-	-	-	66	-[d]	-
Ecuador	1	1	17	28	20	23	6	0	12	14	10	9	14	6	16	5	289	1[d]	-
El Salvador	-	-	7	11	13	6	4	-	-	12	-	-	-	-	-	-	-	-	-
Guatemala	-	2	4	46	-	31	-	13	-	92	-	50	-	14	-	-	66	-	-
Guyana	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Haiti	4	2	63	8	47	10	18	4	-	-	-	-	1	1	-	-	-	-	-
Honduras	2	-	29	6	27	8	10	-	21	40	-	-	2	-	-	-	30	-	-
Mexico	18	17	269	364	452	311	21	11	-	-	-	-	42	3	-	-	2 337	-	-
Nicaragua	1	-	22	-	30	-	30	-	6	-	-	-	22	-	17	-	-	-[c]	-[c]
Panama	1	2	27	21	13	14	4	6	-	34	20	3	22	21	-	-	-	42[c]	43[c]
Paraguay	2	-	24	15	6	-	11	-	134	51	45	5	21	-	-	-	-	30[c]	11[c]
Peru	1	1	32	15	13	6	28	15	3	2	-	-	51	41	7	14	-	-	-
Venezuela	1	0	86	0	58	0	12	0	12	-	30	-	45	-	-	-	365	-	86[e]
Belize	-	-	4[f]	1	5	2	-	-	-	-	-	-	4	2	-[f]	-	-	-	-
Canal Zone	-	-	2[f]	-	-	-	-	-	-	-	-	-	-	-	2[f]	-	-	-	-
French Guiana	1	-	1	-	1	3	2	4	-	-	-	-	2	7	-	3	-	-	-
Surinam	1	1	-	-	4	-	-	-	1	-	3	1	-	-	-	-	-	-	-
Total	82	32	1 031	616	1 608	528	206	66	380	274	785	170	771	143	88	22	5 824	229	193

a) In good conditions. b) In bad conditions. c) Out-board motors. d) Trailer. e) Fogging machines and equipment for ULV. f) Part-time.

E. Budget

Table 21 summarizes expenditures for malaria programs in 1973 by country together with approved budgets for 1974 and, where information is available, estimated budgets for 1975. National expenditures of $69,289,511 in 1974 amounted to an increase of 14.2 per cent over 1973 levels.

As noted in previous reports, there has been a marked reduction in recent years in the amount of external assistance provided to national malaria programs. Graph 2 shows annual expenditures by governments in the Region together with contributions from US/AID, UNICEF and PAHO/WHO for the period 1957-1974. Though the amount of external assistance has markedly declined in recent years, the increase in national expenditures by over 100 per cent in the past 10 years is notable.

Though the increased allocations reflect the high priority that continues to be placed on the hemispheric program, field operations continue to be inadequate in some countries because of increasing costs of personnel, supplies and equipment.

Expenditures of PAHO/WHO in 1974 and the estimated amount of assistance to be provided to countries in 1975 and 1976 are shown in Table 22. The table summarizes by category the number of PAHO/WHO personnel assigned to malaria program activities in 1974 and expected numbers for the two following years.

Table 21

NATIONAL EXPENDITURES 1973-1974 AND BUDGET 1975 FOR MALARIA ERADICATION IN THE AMERICAS

(In U. S. dollars)

Country or other political or administrative unit	National Expenditures 1973			Estimated National Expenditures 1974			National Budget 1975		
	Internal financing	Loans	Total	Internal financing	Loans	Total	Internal financing	Loans	Total
Argentina	1 491 980	-	1 491 980	1 680 665	-	1 680 665	2 321 267	-	2 321 267
Bolivia	276 933	-	276 933	430 783	-	430 783	710 625	-	710 625
Brazil	17 380 273	1 743 599	19 123 872	18 533 362	-	18 533 362	26 323 089	-	26 323 089
Colombia	3 476 793	-	3 476 793	3 940 928	-	3 940 928	3 184 810	1 029 536	4 214 346
Costa Rica	710 972	-	710 972	798 862	-	798 862	976 176	-	976 176
Dominican Republic	779 580	-	779 580	779 580	-	779 580	779 580	-	779 580
Ecuador	1 572 931	-	1 572 931	2 303 031	-	2 303 031	2 909 091	-	2 909 091
El Salvador	1 104 145	-	1 104 145	1 795 612	-	1 795 612	2 259 596	-	2 259 596
Guatemala	1 726 442	-	1 726 442	2 382 816[a]	-	2 382 816[a]	2 642 364[a]	-	2 642 364[a]
Guyana	126 034	-	126 034	60 437	-	60 437	...	-	...
Haiti	131 000	-	131 000	131 000	-	131 000	350 000	-	350 000
Honduras	719 805	-	719 805	696 396	-	696 396	...	...	...
Jamaica	...	-	...	...	-	...	...	-	...
Mexico	16 408 058	-	16 408 058	20 320 000[b]	-	20 320 000[b]	21 154 000	-	21 154 000
Nicaragua	1 308 183	-	1 308 183	2 898 551	-	2 898 551	2 614 000	-	2 614 000
Panama	1 348 906	-	1 348 906	1 430 999	-	1 430 999	2 142 000	-	2 142 000
Paraguay	668 538	125 853	794 391	673 705	85 063	758 768	808 814	-	808 814
Peru	1 420 565	-	1 420 565	1 588 274	-	1 588 274	1 965 508	-	1 965 508
Trinidad and Tobago	...	-	...	...	-	...	...	-	...
Venezuela	6 871 628	-	6 871 628	7 443 525	-	7 443 525	11 627 907	-	11 627 907
Belize	63 690	-	63 690	85 037	-	85 037	...	...	...
French Guiana	799 812	-	799 812	799 812	-	799 812	857 569	-	857 569
Surinam	424 859	-	424 859	431 073	-	431 073	495 480	-	495 480
Total	58 811 127	1 869 452	60 680 579	69 204 448	85 063	69 289 511	84 121 876	1 029 536	85 151 412

... No information available.
a) Includes $182.816 for A.aegypti campaign. b) Includes $200.000 for A.aegypti campaign.

GRAPH 2

MALARIA ERADICATION IN THE AMERICAS
EXPENDITURES, 1957-1974

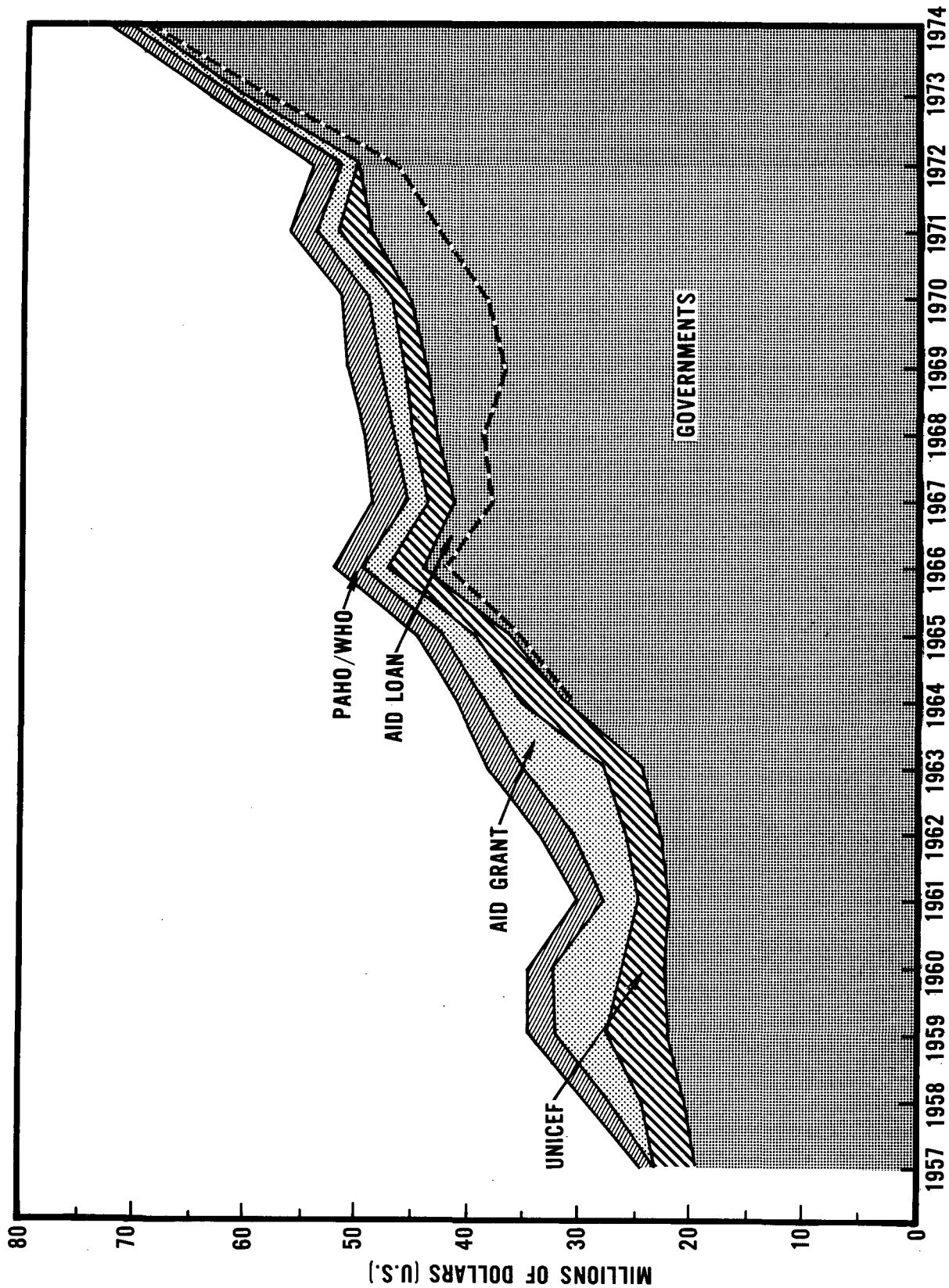


Table 22

ESTIMATED REQUIREMENTS FOR MALARIA ERADICATION PROGRAMS IN THE AMERICAS[a]

	1974[b]	1975[c]	1976[c]
TOTAL COST	72 654 763	88 255 105	-
GOV. AND OTHER SOURCES	70 489 511	86 151 412	(d)
PAHO/WHO PORTIONS:			
Personnel costs and travel	1 878 216	1 818 133	1 932 365
Supplies and equipment	175 111	200 510	198 145
Fellowships	15 989	8 500	7 480
Grants and others	95 936	76 550	81 550
TOTAL	2 165 252	2 103 693	2 219 540

SOURCES OF PAHO/WHO FUNDINGS

SOURCE	1974[b]	1975[c]	1976[c]
PAHO-Reg.	1 294 228	1 206 448	1 355 493
OMS-AT	871 024	897 245	864 047
TOTAL	2 165 252	2 103 693	2 215 540

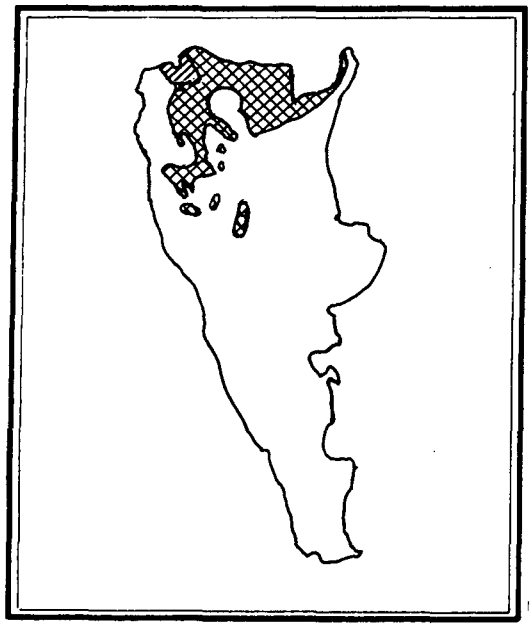
PAHO/WHO PERSONNEL

CATEGORY	1974[b]	1975[c]	1976[c]
Medical Officer	20	19	19
Sanitary Engineer	8	7	6
Entomologist	7	5	4
Parasitologist	3	3	3
Epidemiologist	2	2	2
Economist	1	1	1
Administrative Officer	1	1	1
Laboratory Adviser	1	1	1
Sanitary Inspector	15	17	16
Other	10	9	7
TOTAL	68	65	60

a) Figures shown include all malaria eradication projects, AMRO projects, supporting personnel in Zone Offices and Malaria Eradication Department. b) Expenditures. c) Estimated requirements. d) No information available.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

ARGENTINA



	Population (thousands)	Area km^2
TOTAL COUNTRY	24 650	4 024 458
Non malarious areas	21 636	3 675 407
Originally malarious areas		
Maintenance phase	2 820	317 378
Consolidation phase	58	3 249
Attack phase	136	28 424
Total originally malarious areas	3 014	349 051

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	59	61
Evaluation operations	3	226	229
Administrative and other	-	82	82
Transport	-	53	53
Total	5	420	425

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	15	45	60	120
Two-wheel vehicles	-	-	10	10
Boats	-	-	3	3
Animals	-	-	-	-
Other	-	-	-	-
Total	15	45	73	133

ARGENTINA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
1st	Aug. 59-Jun. 60	1st	81 619	57 995[a]	288 768	205 189	263	...
		2nd	92 438	88 079[a]	347 012	330 733	255	
2nd	Jul. 60-Jul. 61	3rd	84 011	84 929[a]	323 610	327 209	305	...
		4th	84 077	76 991[a]	308 142	282 178	334	
3rd	Aug. 61-Jun. 62	5th	81 906	75 734[a]	303 290	280 425	383	...
		6th	96 249	73 027	341 780	259 379	349	
4th	Jul. 62-Jun. 63	7th	97 908	63 967	351 098	229 432	353	...
		8th	95 552	54 742[a]	318 288	182 273	329	
5th	Jul. 63-Jun. 64	9th	90 333	46 627	317 972	164 420	320	...
		10th	43 572	39 430	135 574	122 685	324	
6th	Jul. 64-Jun. 65	11th	50 322	44 972	172 313	153 995	302	...
		12th	43 927	30 236	138 809	95 417	302	15.7
7th	Jul. 65-Jun. 66	13th	90 224	48 428	327 495	175 788	416	21.1
		14th	66 853	60 220	217 492	195 913	366	19.2
8th	Jul. 66-Jun. 67	15th	65 304	57 484	227 149	199 949	403	12.0
		16th	65 340	58 707	228 690	205 885	462	20.8
9th	Jul. 67-Jun. 68	17th	72 836	83 306	...	292 874	473	21.5
		18th	82 490	83 866	412 000	290 444	481	23.0
10th	Jul. 68-Jun. 69	19th	55 730	54 382	278 000	194 479	454	23.3
		20th	64 705	46 404	207 060	160 922	468	...
11th	Jul. 69-Jun. 70	21st	45 571	38 355	157 190	137 817	479	...
		22nd	9 606	33 385[b]	36 424	116 440[b]	407	9.3
12th	Jul. 70-Jun. 71	23rd	9 606	16 615[b]	36 424	64 071[b]	401	9.7
		24th	3 707	3 861[c]	...	14 666[c]	369	9.0
13th	Jul. 71-Jun. 72	25th	7 492	3 507[c]	...	10 946[c]	392	9.2
		26th	3 614	3 787	...	15 100	414	9.0
-	Jan. 72-Dec. 72	(d)	...	32 261[d]	...	97 223[d]	...	...
-	Jan. 73-Dec. 73	(d)	...	31 507	...	88 712	...	...
-	Jan. 74-Dec. 74	(d)	...	35 156	...	89 494	...	...

a) Some houses were sprayed once a year. b) Includes houses sprayed in consolidation phase areas. c) In addition 28 909 houses were sprayed and 99 373 inhabitants protected in consolidation phase areas. d) Houses and inhabitants protected in consolidation phase areas.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1959a)	12 377	1 043	8.4	-	1 043	-
1960	82 191	2 013	2.4	7	2 006	-
1961	93 464	4 524	4.8	4	4 520	-
1962	112 477	4 685	4.2	-	4 685	-
1963	99 668	834	0.9	-	834	-
1964	102 683	543	0.5	-	543	-
1965	57 872	213	0.4	-	211	2
1966	89 065	300	0.3	-	300	-
1967	111 917	1 512	1.4	-	1 511	1
1968	61 601	418	0.7	-	418	-
1969	40 027	69	0.2	-	69	-
1970	7 979	9	0.1	-	9	-
1971	6 162	2	0.03	-	2	-
1973b)	151b)	0	-	-	-	-
1974b)	6 719	118	1.8	-	118	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1959a)	911	9 491a)	2.5	51	-	-	-	32	-	19	-	-	51	-
1960c)	929	14 438	1.6	26	-	-	-	14	-	12	-	-	26	-
1961c)	1 278	44 395	3.5	17	-	2	-	5	-	10	-	-	17	-
1962c)	1 542	39 675	2.6	23	-	10	-	5	1	7	-	-	20	3
1963c)	1 584	60 742	3.8	11	2	-	-	6	2	-	1	-	9	2
1964d)	1 648	41 926d)	5.1	10	1	-	-	7	-	2	-	-	10	-
	627	24 415	7.8	1	1	-	-	-	-	-	-	-	1	-
1965	449	92 658	20.6	41	20	-	1	8	3	7	2	-	38	3
1966	454	71 346	15.7	56	27	1	1	26	1	-	-	-	56	-
1967	387	82 208	21.2	53	41	1	5	1	-	-	5e)	1	52	-
1968	423	75 300	17.8	126	101	-	8	6	-	-	11	-	126	-
1969	432	41 693	9.7	165	136	16	5	-	-	2	6	-	165	-
1970	1 183	47 206	4.0	70	33	3	13	1	-	2	18	-	70	-
1971	1 211	46 587	3.8	425	250	7	4	-	-	82	82	-	425	-
1972	1 102	46 423	4.2	219	100	5	33	-	-	2	79f)	-	219	-
1973	1 119	40 612	3.6	575	27	5	27	-	-	31	485f)	-	575	-
1974	58	5 423	9.4	20	7	1	-	1	-	8	3	-	20	-

a) August-December. b) Slides examined in non-malarious areas. c) Including maintenance phase area. d) First semester includes maintenance phase. e) Includes one cryptic case. f) Includes cryptic cases.

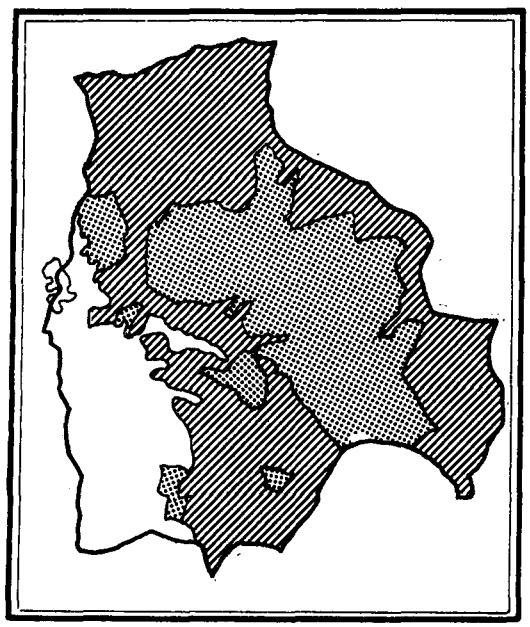
ARGENTINA (Cont.)

MAINTENANCE PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1964[a]	1 021	12 698[a]	2.5	-	-	-	-	-	-	-	-	-	-	-
1965	1 356	32 351	2.4	-	-	-	-	-	-	-	-	-	-	-
1966	1 381	50 870	3.7	55	40	4	1	7	2	1	-	-	53	2
1967	1 477	65 210	4.4	55	49	1	1	1	2	-	1[b]	-	54	1
1968	1 631	103 958	6.4	35	27	-	-	7	-	-	1	-	35	-
1969	1 648	77 458	4.7	13	1	-	1	3	-	7	1	-	13	-
1970	1 585	40 225	2.5	7	-	-	1	2	-	2	2	-	7	-
1971	1 603	46 946	2.9	91	13	2	-	-	1	28	47	-	9	1
1972	1 859	53 383	2.9	140	95	6	2	5	-	25	7	-	140	-
1973	1 887	51 478	2.7	230	66	10	7	16	1	63	67[c]	-	230	-
1974	2 820	59 026	1.4	33	2	3	8	6	-	9	5[c]	-	33	-

a) July-December. b) Cryptic case. c) Includes cryptic cases.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



BOLIVIA

	Population (thousands)	Area km^2
TOTAL COUNTRY	5 482	1 098 581
Non malarious areas	3 717	277 235
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 052	367 940
Attack phase	713	453 406
Total originally malarious areas	1 765	821 346

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	49 (149)	49 (149)
Evaluation operations	9	138	147
Administrative and other	18	13	31
Transport	31	9	40
Total	58	209 (149)	267 (149)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	12	32	12	56
Two-wheel vehicles	-	15	-	15
Boats	10	10	5	25
Animals	-	-	70	70
Other	14	20	17	51
Total	36	77	104	217

BOLIVIA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	Sep. 58-Aug. 59	1st 2nd	131 444 148 200	116 572 129 119	1st	6 365	10 910	627 362 691 820	556 190 627 210	362 331	115	8.3 7.0
2nd	Sep. 59-Aug. 60	3rd 4th	147 263 153 514	136 601 142 536	2nd	11 331	12 268	695 521 692 274	634 859 660 185	319 309	118	7.6 7.2
3rd	Sep. 60-Aug. 61	5th 6th	169 690 142 210	159 952 134 173	-	-	-	742 902 612 356	700 295 577 743	331 329	-	7.6 7.5
4th	Sep. 61-Sep. 62	7th 8th	129 600 135 474	124 623 128 898	-	-	-	546 005 551 785	524 986 525 005	353 359	-	7.9 8.6
5th	Oct. 62-Sep. 63	9th 10th	32 561 32 361	34 469 28 893	-	-	-	124 643 110 578	131 962 98 727	408 428	-	6.0 5.9
6th	Oct. 63-Sep. 64	11th 12th	32 361 28 536	32 160 27 509	-	-	-	123 923 101 503	123 152 97 855	533 547	-	5.3 5.6
7th	Jan. 65-Dec. 65	13th 14th	26 941 26 941	24 634 16 357	-	-	-	96 020 94 987	87 799 57 671	557 575	-	5.3 4.1
8th	Jan. 66-Dec. 66	15th 16th	27 130 27 130	29 752 23 839	-	-	-	97 375 100 023	106 787 87 890	588 617	-	4.7 4.6
9th	Jan. 67-Dec. 67	17th 18th	24 161 24 992	24 733[a] 30 254[a]	-	-	-	86 980 89 971	82 565[a] 90 813[a]	654 584	-	4.9 4.5
10th	Jan. 68-Dec. 68	19th 20th	24 156 21 387	20 861[a] 32 353[a]	-	-	-	80 075 70 897	79 631[a] 95 240[a]	543 609	-	6.1 4.7
11th	Jan. 69-Feb. 70	21st 22nd	23 886 28 189	14 715[a] 32 220[a]	-	-	-	84 112 100 137	55 933[a] 124 712	513 478	-	7.4 7.1
12th	Mar. 70-Dec. 70	23rd 24th	42 220 24 178	43 233 16 187	-	-	7 502[b]	151 351 100 348	155 993 65 657	571 572	-	6.4 6.0
13th	Jan. 71-Dec. 71	25th 26th	23 426 23 954	23 888 27 202	-	-	7 161[c]	76 755 82 252	81 089 102 627	543 531	-	6.4 7.3
14th	Jan. 72-Jun. 72 Oct. 72-Jan. 73	27th 28th	34 934 34 386	31 117 34 217	-	13 858	12 158[c]	125 934 142 173	114 501 132 180	544 491	-	6.9 7.4
15th	Feb. 73-Jul. 73 Oct. 73-Jan. 74	29th 30th	37 356 36 076	37 539 31 638	24-25	15 587	16 221[d]	138 018 130 882	141 381 122 678	520 504	- -	7.3 7.6
16th	Mar. 74-Jun. 74 Sep. 74-Dec. 74	31th 32th	40 389 40 323	39 010 39 596	26	8 119	7 871[b]	149 242 146 947	151 504 155 135	499 512	-	7.1 7.2

a) Includes emergency sprayings. b) Houses sprayed with DDT once a year. c) Houses sprayed with DDT in 3 quarterly cycles.
d) Total of two semestrial cycles with DDT in Zone I.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive				
		Number	Percentage	P. falciparum a)	P. vivax	P. malariae
1958b)	3 426	257	7.5	53	143	61
1959	83 762	1 970	2.4	243	1 419	308
1960	87 775	893	1.0	143	621	129
1961	141 033	782	0.6	58	711	13
1962	159 397	1 089	0.7	378	700	11
1963	117 432	2 241	1.9	906	1 335	-
1964	89 333	3 002	3.4	477	2 525	-
1965	150 800	845	0.6	136	709	-
1966	133 735	1 005	0.8	188	817	-
1967	113 500	811	0.7	95	716	-
1968	97 996	1 170	1.2	288	882	-
1969	133 274	3 360	2.5	787	2 573	-
1970	135 262	5 603	4.1	646	4 957	-
1971	137 570	7 165	5.2	690	6 475	-
1972	109 541	3 714	3.4	364	3 350	-
1973	95 629	7 151	7.5	638	6 513	-
1974	94 804	4 676	4.9	346	4 329	1

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1961c)	461	11 975	2.6	14	1	1	5	7	-	-	-	-	14	-
1962c)	759	18 131c)	3.2	21	-	-	2	19	-	-	-	-	21	-
1963c)	1 179	58 587c)	7.4	104	18	1	-	73	-	2	10	4	100	-
1964	1 141	66 207	5.8	452	154	7	5	21	-	-	265	20	430	2
1965	1 173	119 954	10.2	96	50	-	8	22	-	-	16	2	92	2
1966	1 202	126 410	10.5	368	209	11	-	59	-	-	89	26	342	-
1967	1 214	101 037	8.3	631	269	1	4	26	-	-	331d)	105	526	-
1968	1 245	89 639	7.2	828	499	13	7	52	-	-	257	184	644	-
1969	1 174	52 025	4.4	1 065	465	13	4	36	-	-	547	104	961	-
1970	1 389	32 003	2.3	1 259	265	1	4	25	-	-	964	5	1 254	-
1971	973	21 216	2.2	915	9	-	32	6	-	-	868	9	906	-
1972	999	23 209	2.3	561	71	-	-	69	-	-	421e)	-	561	-
1973	1 025	22 788	2.2	545	232	-	2	149	-	-	320e)	2	543	-
1974	1 052	20 001	1.9	260	128	-	1	26	-	-	105	3	257	-

a) Includes mixed infections. b) September-December. c) January-September. d) Includes 1 congenital case. e) Includes cryptic cases.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

BRAZIL

	Population (thousands)	Area km^2
TOTAL COUNTRY	104 642	8 511 965
Non malarious areas	62 538	1 614 074
Originally malarious areas		
Maintenance phase	4 470	82 402
Consolidation phase	14 889	188 496
Attack phase	22 745	6 626 993
Total originally malarious areas	42 104	6 897 891

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	33	5 694 (4)	5 727
Evaluation operations	49	4 558 (8)	4 607
Administrative and other	1	137	138
Transport	-	696	696
Total	83	11 085 (12)	11 168

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	263	23	765	1 051
Two-wheel vehicles	-	493	-	493
Boats	5	-	316	322
Animals	1 336	-	-	1 336
Other	-	-	-	-
Total	1 604	516	1 081	3 201

BRAZIL (Excl. São Paulo) (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
(a)	Jan. 61-Nov. 61	(a)	820 095	814 475[b]	3 399 300[c]	3 380 000[c]	...	...
(a)	Jan. 62-Jun. 62	...	1 622 052	1 350 566	7 016 997	5 843 075	424	...
	Jul. 62-Dec. 62	...	2 292 000	1 960 358	9 724 956	8 317 433	420	...
(a)	Jan. 63-Jun. 63	...	2 062 265	1 726 289	8 574 898	7 178 751	407	...
	Jul. 63-Dec. 63	...	2 045 534	2 010 035	8 524 558	8 376 676	414	7.5
(a)	Jan. 64-Jun. 64	...	2 532 153	1 899 065	10 502 357	7 876 719	412	7.9
	Jul. 64-Dec. 64	...	2 993 954	2 350 055	12 310 241	9 662 834	419	7.7
(a)	Jan. 65-Jun. 65	...	1 799 354	1 588 551	7 361 157	6 498 902	414	7.7
	Jul. 65-Dec. 65	...	2 388 893	2 092 159	9 364 460	8 201 391	413	7.6
(a)	Jan. 66-Jun. 66	...	2 556 302	1 925 160	9 829 492	7 402 633	408	7.8
	Jul. 66-Dec. 66	...	2 800 000	2 241 208	10 900 000	8 724 032	389	7.4
(a)	Jan. 67-Jun. 67	...	2 741 666	2 276 072	10 323 308[c]	8 833 213	421	7.7
	Jul. 67-Dec. 67	...	3 244 299	2 673 073	12 328 336[c]	10 459 348	447	7.4
(a)	Jan. 68-Jun. 68	...	3 187 958	2 820 339	12 434 919	10 931 796	439	7.5
	Jul. 68-Dec. 68	...	4 077 323	3 682 956	15 899 767	14 721 063	453	7.3
(a)	Jan. 69-Jun. 69	...	4 079 989	3 601 762	...	14 279 724	438	7.6
	Jul. 69-Dec. 69	...	2 222 487	2 266 725	...	8 906 772	437	7.7
(a)	Feb. 70-Jun. 70	...	3 795 372	3 466 314	15 196 516	13 583 020	420	7.5
	Jul. 70-Dic. 70	...	3 837 845	2 120 139	15 363 852	8 188 955	430	7.5
(a)	Jan. 71-Dec.71	...	2 265 879	1 305 711	8 836 928	5 251 767	433	7.5
			3 452 789	3 095 578	13 465 877	12 090 715	456	7.0
(a)	Jan. 72-Dec.72	...	3 574 130	3 222 996	12 090 394	12 414 387	454	7.4
			3 447 863	3 548 605	12 414 387	13 584 673	457	7.1
(a)	Jan. 73-Dec.73	...	3 869 420	3 489 770	12 874 954	13 143 334	448	7.3
			3 669 727	3 153 465	12 220 193	12 014 195	455	7.2
(a)	Jan.74 -Dec.74	...	3 657 772	2 978 951	12 039 811	11 750 496	484	7.4
			3 686 035	2 728 056	12 040 280	10 439 053	456	7.3

a) Owing to different spray cycle timing in different regions, these data refer to the calendar year. b) Sprayings. c) Estimated.

BRAZIL (São Paulo) (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
1st	Jan. 60-Jan. 61	1st	481 533	455 219	2 002 214	1 892 679	433	8. 4
		2nd	475 121	458 926	1 992 182	1 924 405	404	9. 8
2nd	Feb. 61-Jan. 62	3rd	441 104	436 048	1 870 722	1 849 398	416	9. 4
		4th	436 057	431 473	1 807 892	1 789 051	412	9. 7
3rd	Feb. 62-Jan. 63	5th	381 254	380 623	1 605 079	1 602 444	419	9. 7
		6th	385 555	383 717	1 558 413	1 550 975	420	9. 8
4th	Feb. 63-Jan. 64	7th	378 922	366 817	1 525 540	1 477 021	424	9. 7
		8th	324 556	316 221	1 346 907	1 312 405	433	9. 5
5th	Feb. 64-Jan. 65	9th	113 293	110 114	379 362	368 721	444	8. 1
		10th	113 257	109 480	449 981	434 974	440	8. 3
6th	Feb. 65-Mar. 66	11th	43 711	43 313	171 413	169 855	436	8. 3
		12th	36 050	35 766	139 550	138 459	412	7. 8
7th	Mar. 66-Jan. 67	13th	35 646	33 407	134 850	126 375	405	8. 1
	Jul. 66-Jun. 67	14th	32 523	29 923	123 424	114 484	393	7. 8
8th	Feb. 67-Dec. 67	15th	32 450	42 379	123 310	142 370	388	8. 6
	Jan. 68-Jun. 68	16th	22 252	23 910	...	170 314	426	8. 5
9th	Jul. 68-Jul. 69	17th	22 252	18 292	...	77 154	401	9. 3
		18th	22 522	20 628	86 000	67 973	441	8. 0
10th	Aug. 69-Jun. 70	19th	22 246	18 628	80 000	62 515	408	8. 8
		20th	19 757	17 731	64 000	59 550	395	8. 7
11th	Jul. 70-Jun. 71	21th	19 187	16 468	64 276	53 159	381	8. 8
		22nd	17 150	16 162	55 650	49 639	402	8. 2
12th	Jul. 71-Jun. 72	23rd	16 162	14 484	52 200	45 959	421	8. 2
		24th	15 213	14 055	49 500	45 909	398	8. 4
13th	Jul. 72-Jun. 73	25th	14 828	13 424	48 500	42 137	408	9. 0
		26th	14 137	11 185	44 500	34 454	419	8. 6
14th	Jul. 73-Jun. 74	27th	12 057	10 597	34 500	32 102	402	8. 7
		28th	2 327	2 239	6 483	6 101	357	10.2
15th	Jul. 74-Dec. 74	29th	2 255	2 148	6 017	6 153	369	10.5

BRAZIL (Excl. São Paulo) (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1961	230 205	36 912[a]	16.03	3 620	32 285	2
1962	513 767	68 371	13.31	22 683	45 683	5
1963	860 681	109 210	12.69	37 502	71 610	98
1964	1 241 242	109 507	8.82	41 737	67 713	57
1965	1 549 679	108 687	7.01	51 007	57 573	107
1966[b]	1 493 309	106 655	7.14	57 349	49 060	246
1967	1 516 120	100 919	6.65	56 681	44 014	224
1968[c]	1 336 101	79 154	5.92	43 232	35 687	235
1969	1 390 046	55 799	4.01	30 866	24 785	148
1970	1 059 955	53 261	5.02	27 994	25 116	151
1971	1 095 813	78 639	7.17	45 424	32 793	84
1972	1 474 523	83 323	5.65	50 639	32 625	59
1973	1 662 554	77 375	4.66	40 941	35 924	51
1974	1 712 420	64 934	3.79	29 592	35 255	87

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1965[d]	1 439	132 231[d]	9.2	70	1	1	-	60	-	-	8	14	56	-
1966[d]	2 541	162 102[d]	8.5	228	54	7	-	98	-	-	69	34	194	-
1967	6 000	426 185	7.1	586	171	65	-	157	3	4	186	209	377	-
1968	5 926	537 347	9.1	1 148	261	11	4	542	3	17	310	591	556	1
1969	6 380	554 881	8.7	252	63	2	-	60	2	-	125	100	150	2
1970	7 915	505 319	6.4	147	30	5	-	75	2	1	34	52	94	1
1971	11 009	616 539	5.6	417	26	4	-	149	5	1	232	286	131	-
1972	11 476	576 714	5.0	863	239	3	2	369	4	1	245	377	485	1
1973	11 770	462 478	3.9	718	286	3	-	179	7	5	238[e]	185	533	-
1974	12 066	403 646	3.3	363	39	1	-	227	4	6	86	86	273	4
MAINTENANCE PHASE AREAS														
1966[d]	733	22 161[d]	4.0	7	-	-	-	7	-	-	-	3	3	1
1967	756	23 588	3.1	9	1	-	-	8	-	-	-	2	7	-
1968[c]	780	19 690	2.5	10	-	-	-	10	-	-	-	-	10	-
1969	804	21 495	2.7	5	-	-	-	4	-	-	1[e]	1	4	-
1970	830	21 287	2.6	8	-	-	-	8	-	-	-	4	4	-
1971	843	9 323	1.1	8	-	-	-	8	-	-	-	1	7	-
1972	866	10 364	1.2	5	-	1	-	3	-	-	1	-	5	-
1973	888	15 822	1.8	16	1	-	-	7	-	2	6	3	13	-
1974	904	4 550	0.5	9	1	-	-	8	-	-	-	-	9	-

a) Includes 1 005 undifferentiated mixed infections from Espirito Santo Sector. b) Includes 4th quarter for areas in consolidation and maintenance phases. c) Data for last 2 months not separated by phase. d) January-September. e) Cryptic cases.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

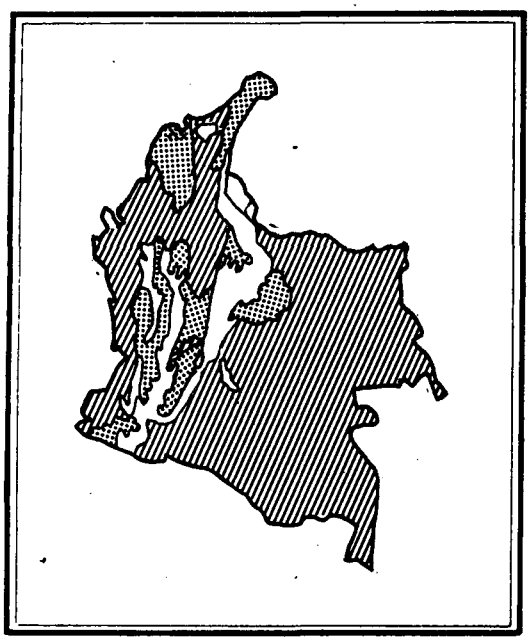
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1960	114 622	8 297	7.2	66	8 230	1
1961	208 502	7 276	3.5	258	7 015	3
1962[a]	370 667	3 689	1.0	227	3 459	3
1963[a]	384 993	2 207	0.6	427	1 778	2
1964	227 608	1 295	0.6	235	1 060	-
1965	52 554	858	1.6	140	717	1
1966	37 502	758	2.0	108	650	-
1967	90 194	1 067	1.2	269	796	2
1968	65 264	434	0.7	205	229	-
1969	35 064	374	1.1	169	204	1
1970	239 691	815	0.3	341	474	-
1971	49 603	439	0.9	230	207	2
1972	48 491	290	0.6	77	213	-
1973	36 612	302	0.8	102	200	-
1974	15 438	362	2.3	85	277	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1964	2 183	307 014	14.1	476	21	15	-	402	-	9	29	69	407	-
1965	3 766	140 491	3.7	691	29	3	-	599	6	10	44	112	579	-
1966	3 974	139 865	3.5	982	295	9	2	622	2	5	47	234	747	1
1967	5 152	95 383	1.9	261	43	1	-	199	2	13	3	105	154	2
1968	5 152[b]	123 277	2.4	578	99	1	4	426	1	1	46	261	317	-
1969	5 758	138 399	2.4	521	100	-	-	376	2	16	27	210	311	-
1970	5 865	204 207	3.5	413	28	2	-	288	1	3	91	166	247	-
1971	5 962	241 334	4.0	791	32	-	-	543	3	1	212	326	460	5
1972	2 541	127 043	5.0	557	57	-	-	329	4	4	163[c]	235	322	-
1973	2 618	109 129	4.2	435	10	-	-	323	1	-	101[c]	168	267	-
1974	2 823	115 880	4.1	531	29	-	-	389	-	2	111[c]	149	382	-
MAINTENANCE PHASE AREAS														
1972	3 399	54 547	1.6	287	7	-	-	218	1	1	60	92	195	-
1973	3 500	42 968	1.2	315	2	-	-	230	1	-	82	144	170	1
1974	3 566	19 757	0.6	282	2	1	-	214	2	-	63	85	197	-

a) Data for entire State, not separated by attack or consolidation phase. b) 1967 population. c) Includes cryptic cases.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



COLOMBIA

	Population (thousands)	Area km^2
TOTAL COUNTRY	23 952	1 138 914
Non malarious areas	9 800	168 065
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	9 630	113 176
Attack phase	4 466	845 605
Preparatory phase	56	12 068
Total originally malarious areas	14 152	970 849

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	10	721	731
Evaluation operations	15	553	568
Administrative and other	2	309	311
Transport	-	297	297
Total	27	1 880	1 907

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	131	90	148	369
Two-wheel vehicles	-	192	46	238
Boats	102	139	27	268
Animals	475	720	30	1 225
Other	117	-	41	158
Total	292	1 141	292	2 258

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
1st	Oct. 58-Sep. 59	1st	1 235 473	1 181 235	6 900 118	6 597 002	466	6.6
		2nd	1 240 810	1 176 392	6 848 030	6 492 119	425	8.9
2nd	Oct. 59-Sep. 60	3rd	1 273 295	1 196 930	6 915 265	6 500 325	409	9.4
		4th	1 228 550	1 162 059	6 556 771	6 201 358	309	8.7
3rd	Oct. 60-Sep. 61	5th	1 253 594	1 181 557	6 642 794	6 261 680	394	9.7
		6th	1 050 556	945 501[a]	5 320 016	4 788 305	402	9.3
4th	Oct. 61-Sep. 62	7th	796 056	738 459[a]	3 997 793	3 708 400	408	8.9
		8th	789 399	693 315[a]	3 928 049	3 449 630	421	8.8
5th	Oct. 62-Sep. 63	9th	701 762	586 740[b]	3 440 739	2 876 514	435	8.4
		10th	690 726	576 540[b]	3 363 145	2 806 950	459	7.9
6th	Oct. 63-Dec. 64	11th	582 580	508 501[b]	2 801 627	2 445 856	437	7.9
		12th	365 843	362 793	1 710 645	1 696 396	602	6.0
7th	Jan. 65-Dec. 65	13th	376 662	373 763	1 746 130	1 732 717	630	5.8
		14th	378 869	370 239	1 762 953	1 722 802	589	5.8
8th	Jan. 66-Dec. 66	15th	375 005	339 962	1 705 523	1 546 160	572	5.3
		16th	342 605	337 266	1 577 353	1 552 673	590	5.4
9th	Jan. 67-Dec. 67	17th	343 363	340 212	1 545 133	1 543 350	595	5.3
		18th	409 174	401 683	1 923 118	1 895 349	534	5.3
10th	Jan. 68-Dec. 68	19th	484 075	449 431	2 294 006	2 120 499	567	5.4
		20th	502 051	467 461[c]	2 375 849	2 285 575	455	5.3
11th	Jan. 69-Dec. 69	21st	463 187	449 028[d]	2 141 790	1 813 709	529	5.5
		22nd	464 692	531 550[d]	2 146 877	2 098 882	532	5.5
12th	Jan. 70-Dec. 70	23rd	427 433	466 893[e]	1 901 090	1 924 380	518	5.8
		24th	426 724	456 050[e]	1 889 861	1 864 001	522	5.6
13th	Jan. 71-Dec. 71	25th	406 230	454 506[f]	1 868 658	1 764 643	534	5.4
		26th	399 157	419 404[f]	1 726 772	1 732 185	450	5.5
14th	Jan. 72-Dec. 72	27th	262 803	348 337[g]	1 156 061	1 127 860	531	5.7
		28th	277 866	323 075[g]	1 233 149	1 182 487	467	5.8
15th	Jan. 73-Dec. 73	29th	309 949	379 431[h]	1 346 340	1 225 234	403	5.4
		30th	309 744	374 693[h]	1 406 032	1 231 188	407	5.6
16th	Jan. 74-Dec. 74	31th	309 463	270 753	1 454 476	1 307 197	400	5.7
		32nd	307 002	262 579	1 427 149	1 268 268	393	5.7

a) Some houses were sprayed in annual cycles. b) Some houses were sprayed in cycles of one, three and four times a year. c) Beginning September some houses were sprayed with 1 g. per m^2. d) Includes 82 377 houses from quarterly cycles and 34 988 houses in consolidation phase. e) Includes 73 752 houses in quarterly cycles and 28 853 in annual cycles. f) In addition 45 312 houses were sprayed in quarterly cycles and 73 752 houses in annual cycles and 11 634 emergency sprayings. g) Includes 170 534 houses sprayed in annual cycle and 13 124 from quarterly cycles. h) Includes 125 979 houses sprayed in annual cycles and 109 653 houses sprayed in emergency cycles.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
1959	329 288	4 172	1.3	1 195	2 942	35
1960	509 920	8 426	1.6	3 758	4 642	26
1961	570 160	16 974	3.0	10 235	6 694	45
1962	626 995	17 350	2.8	9 619	7 697	34
1963	456 592	17 448	3.8	9 113	8 311	24
1964	321 115	13 515	4.2	8 070	5 423	22
1965	174 664	14 729	8.4	9 591	5 125	13
1966	293 472	17 538	6.0	10 392	7 135	11
1967	391 566	22 416	5.7	13 167	9 188	61
1968	477 495	24 869	5.2	14 798	10 050	21
1969	351 586	34 335	9.8	21 237	13 081	17
1970	310 339	27 387	8.8	15 680	11 690	17
1971	263 425	18 816	7.1	10 416	8 396	4
1972	307 032	26 924	8.8	15 788	10 952	6
1973	343 800	51 773	15.1	32 516	19 253	4
1974	193 273	19 002	9.8	8 822	10 176	4

AREAS EN FASE DE CONSOLIDACION

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1962b)	3 027	70 250b)	3.1	147	48	4	-	72	5	-	18	99	48	-
1963	5 305	120 814	2.3	450	83	1	-	279	7	7	73	262	188	-
1964	6 053	178 408	3.0	1 214	224	-	1	774	-	27	188	578	635	1
1965	7 071	316 044	4.5	3 548	464	2	13	2 129	8	4	928	2 002	1 543	3
1966	8 193	362 425	4.4	4 597	1 007	3	23	2 477	3	22	1 062	2 120	2 475	2
1967	8 127	435 945	5.4	4 217	1 274	3	26	2 075	4	31	804	2 459	1 756	2
1968	7 803	381 362	4.9	2 464	419	5	22	1 609	2	14	393	1 166	1 294	4
1969	8 580	416 280	4.9	5 100	457	-	37	3 302	5	8	1 291	2 855	2 245	-
1970	8 382	375 073	4.5	4 885	478	9	70	2 921	5	4	1 398	2 295	2 590	-
1971	8 650	341 348	3.9	3 586	1 067	15	71	1 862	4	7	560	1 306	2 279	1
1972	8 926	339 367	3.8	4 073	946	8	43	2 296	7	4	769c)	1 921	2 152	-
1973	9 292	287 763	3.1	4 721	424	7	50	3 336	5	11	888c)	2 119	2 602	-
1974	9 630	210 847	2.2	3 404	487	7	35	2 390	5	11	469c)	1 453	1 951	-

a) Includes mixed infections. b) April-December. c) Includes cryptic cases.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

COSTA RICA

	Population (thousands)	Area km^2
TOTAL COUNTRY	1 908	50 900
Non malarious areas	1 273	15 454
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	437	19 941
Attack phase	198	15 505
Total originally malarious areas	635	35 446

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	80	80
Evaluation operations	2	124	126
Administrative and other	1	48	49
Transport	-	21	21
Total	3	273	276

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	35	14	49
Two-wheel vehicles	-	100	-	100
Boats	-	-	22	22
Animals	-	40	-	40
Other	-	-	-	-
Total	-	175	36	211

COSTA RICA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
1st	Jul. 57-Aug. 58	1st	67 059	53 297	331 070	263 123	464	5.1
		2nd	58 641	58 624	287 634	287 537	419	7.4
2nd	Sep. 58-Sep. 59	3rd	58 858	60 800	282 930	292 856	465	6.9
		4th	60 413	63 063	290 405	303 151	531	7.1
3rd	Oct. 59-Sep. 60	5th	63 259	63 884	302 568	305 586	512	8.6
		6th	64 057	66 961	302 926	316 629	475	9.3
4th	Oct. 60-Sep. 61	7th	68 300	66 242	317 185	307 601	473	9.4
		8th	65 567	68 277	307 903	320 603	485	9.2
5th	Oct. 61-Dec. 62	9th	69 643	58 910	332 545	281 295	492	8.8
		10th	26 075	30 684	120 753	142 102	508	9.6
6th	Jan. 63-Feb. 64	11th	21 582	21 443	99 300	99 083	509	8.6
		12th	22 764	24 003	105 260	110 988	526	8.2
7th	Mar. 64-Oct. 65	13th	23 046	22 098	107 413	102 996	610	8.0
		14th	32 623	29 827[a]	186 395	170 422	727	6.1
8th	Nov. 65-Nov. 66	15th	34 288	38 823[b]	210 665	194 338	116[c]	7.0
		16th[d]	...	13 024[e]	...	58 826	118[c]	7.4
9th	Apr. 67-Nov. 67	17th	67 940	67 323	...	311 829	633	6.3
		(f)	...	10 640	...	48 812	594	7.3
10th	Jan. 68-Dec. 68	18th	72 549	66 751	340 980	327 111	546	5.5
		19th	73 229	65 867	361 972	325 927	542	5.4
11th	Jan. 69-Dec. 69	20th	73 537	68 123[g]	366 279	344 390	560	6.8
		21st	74 725	69 299[g]	374 106	350 340	554	6.4
12th	Jan. 70-Dec. 70	22nd	67 906	65 509[g]	339 810	306 594	542	6.9
		23rd	69 624	62 835[g]	342 324	305 819	557	6.9
13th	Jan. 71-Dec. 71	24th	48 651	49 653[h]	289 910	235 022	615	6.1
		25th	48 347	46 181[h]	266 013	214 152	618	6.3
14th	Jan. 72-Dec. 72	26th	45 747	45 738[i]	210 173	211 871	606	6.6
		27th	47 422	46 838[i]	211 871	215 038	550	6.8
15th	Jan. 73-Dec. 73	28th	38 171	31 460[j]	167 720	146 563[j]	595	6.1
		29th	38 376	31 995[j]	170 060	148 582[j]	470	6.1
16th	Jan. 74-Dec. 74	30th	31725	31552	142762	147571k)	595	6.3
		31th	31299	31162	149 962	142802k)	588	6.3

a) In addition 3 573 houses were sprayed with dieldrin. b) With dieldrin; plus 5 660 emergency sprayings with dieldrin and 1 532 with DDT. c) Dieldrin. d) Operations suspended. e) With dieldrin; plus 1 396 sprayings with DDT. f) Emergency sprayings. g) Does not include focal sprayings. h) In addition 10 561 houses were sprayed in quarterly cycles, 4 330 emergency sprayings and 6 182 with Propoxur. i) Does not include 4 873 houses sprayed with DDT in quarterly cycles and 7 658 houses sprayed with Propoxur. j) In addition 10 882 houses were sprayed with Propoxur and 47 635 inhabitants were protected. k) In addition 12.915 houses were sprayed with Propoxur and 65.313 inhabitants were protected.

COSTA RICA (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

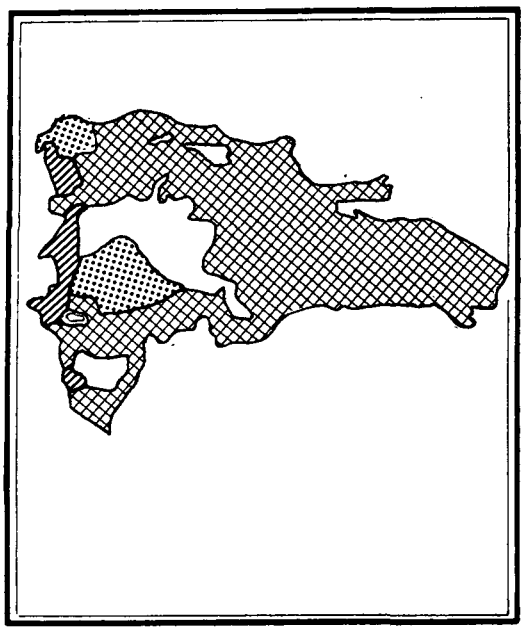
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
1957	18 136	1 153	6.4	98	1 037	18
1958	36 801	2 139	5.8	151	1 981	7
1959	52 536	1 899	3.6	121	1 775	3
1960	67 643	2 000	3.0	64	1 936	-
1961	87 893	1 673	1.9	18	1 655	-
1962	131 058	1 482	1.1	5	1 476	1
1963	124 475	857	0.7	7	850	-
1964	47 940	566	1.2	-	566	-
1965	95 027	1 846	1.9	1	1 845	-
1966	121 696	2 594	2.1	1	2 593	-
1967	138 486	4 349	3.1	-	4 349	-
1968	115 889	1 156	1.0	-	1 156	-
1969	170 790	679	0.4	-	679	-
1970	161 847	324	0.2	4	319	1
1971	139 440	172	0.1	7	165	-
1972	142 422	125	0.1	2	123	-
1973	98 135	109	0.1	14	95	-
1974	73 248	101	0.1	12	89	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1962 b)	230	52 594 b)	45.7	101	-	15	4	12	-	51	19	-	101	-
1963	255	133 375	52.3	371	244	45	-	7	-	10	65	-	371	-
1964	294	75 345	25.6	646	351	19	2	16	-	1	257	10	636	-
1965	263	102 724	39.1	717	196	3	-	4	-	2	512	3	714	-
1966	276	128 439	46.5	453	154	7	4	13	-	49	226	-	453	-
1967	151	25 623	17.0	94	41	-	-	16	-	-	37	-	94	-
1968	156	26 140	16.8	35	11	5	-	10	-	8	1	-	35	-
1969	87	31 572	36.3	9	1	1	3	1	-	-	3	-	9	-
1970	100	33 637	33.6	26	21	-	1	1	2	-	1	1	25	-
1971	178	45 571	25.6	85	74	-	7	1	-	-	3	3	82	-
1972	188	48 730	25.9	34	9	-	5	8	-	-	12	1	33	-
1973	417	68 220	16.4	52	34	-	12	5	-	-	1	4	48	-
1974	437	81 408	18.6	51	17	-	29	2	-	3	-	9	42	-

a) Includes mixed infections. b) Started in July 1962.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



DOMINICAN REPUBLIC

	Population (thousands)	Area km^2
TOTAL COUNTRY	4 562	48 442
Non malarious areas	29	880
Originally malarious areas		
Maintenance phase	4 408	44 280
Consolidation phase	35	537
Attack phase	90	2 745
Total originally malarious areas	4 533	47 562

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	14	15
Evaluation operations	1	229	230
Administrative and other	1	48	49
Transport	-	30	30
Total	3	321	324

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	3	47	11	61
Two-wheel vehicles	-	143	-	143
Boats	-	-	-	-
Animals	-	66	-	66
Other	-	-	-	-
Total	3	256	11	270

DOMINICAN REPUBLIC (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed with DDT						Inhabitants directly protected		Insecticide used per house (g. technical)	Average houses sprayed per spray-man/day
		Twice a year			Once a year						
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	
3rd[a]	Mar. 60-Mar. 62	1st	428 615	332 944	-	-	-	2 206 080	1 713 612	495	9.0
		2nd	428 615	204 531				2 241 656	1 083 459	472	8.4
(b)	Apr. 62-Oct. 62	3rd	428 615	72 499	-	-	-	2 241 656	368 201	424	8.4
4th	Nov. 62-Mar. 64	1-A	462 900	438 706	-	-	-	2 530 674	2 398 328	468	8.2
		2-A	472 000	359 653				2 428 110	1 850 166	475	8.4
5th	Apr. 64-Mar. 65	2-B	490 000	480 537	-	-	-	2 316 181	2 271 494	449	9.8
		3-A	510 575	500 343				2 315 764	2 269 357	355	10.5
6th	Apr. 65-Jun. 66	3-B	450 215	411 193	-	-	-	2 104 080	1 921 727	357	10.0
		4-A	68 444	68 056		89 312	117 205[c]	728 974	856 077	335	10.4
7th	Jul. 66-Jun. 67	4-B	72 769	77 956	-	89 312	25 548	778 783	497 333	339	9.5
		5-A	80 772	78 252		87 038	46 259	671 240	573 884	348	10.6
8th	Jul. 67-Jun. 68	5-B	83 802	80 271	-	87 038	36 622[c]	683 360	520 388	363	10.3
		6-A	73 726	71 011		-	118[d]	346 512[e]	336 423	346	11.1
9th	Jul. 68-Jun. 69	6-B	79 143	72 675	-	-	1 093[d]	371 972[e]	347 189	344	10.5
		7-A	77 006	71 818			-	347 189	341 660	365	10.5
10th	Jul. 69-Jun. 70	7-B	68 036	64 371	-	-	-	307 016	311 958	352	9.9
		8-A	66 729	63 938				299 427	304 552	351	9.7
11th	Jul. 70-Jun. 71	8-B	58 970	56 874	-	-	-	270 123	273 700	340	10.2
		9-A	23 493	22 148				96 789	95 945	405	8.3
12th	Jul. 71-Jun. 72	9-B	21 482	18 911	-	-	-	85 269	81 957	399	8.4
		10-A	15 250	13 550				60 596	59 764	403	8.3
13th	Jul. 72-May 73	10-B	10 768	9 528	-	-	-	43 125	42 303	429	7.3
			6 066	5 599	-	-	-	24 443	25 147	381	7.3
14th	Jun. 73-Apr. 74	11-B	6 205	5 163	-	-	-	25 147	23 506	388	7.5
		12-A	5 927	5 686	-	-	-	23 506	26 082	417	7.7
15th	May. 74-Oct. 74	12-B	6 648	5 792	-	-	-	26 082	26 244	399	7.5

a) Previous coverage with dieldrin. b) Cycle suspended. c) Includes emergency sprayings. d) Emergency sprayings. e) Estimated.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

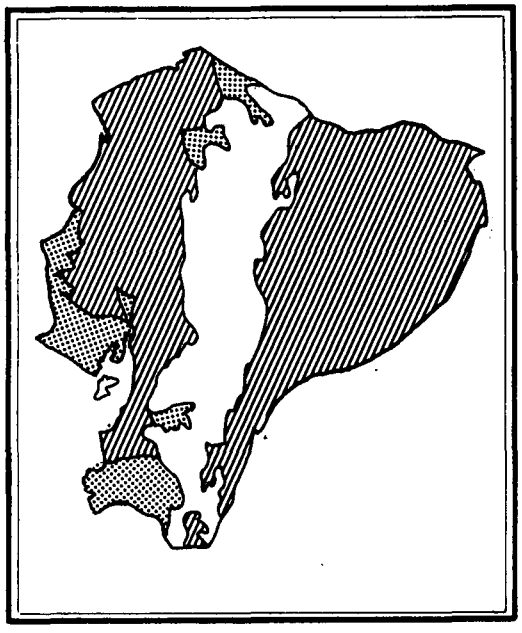
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958 a)	17 784	2 676	15.0	...	...	...
1959	28 721	3 743	13.0	1 968	1 767	8
1960	20 337	5 540	27.2	3 583	1 949	8
1961	21 946	2 523	11.5	1 164	1 358	1
1962	19 742	548	2.8	275	271	2
1963	73 352	386	0.5	129	256	1
1964	121 211	321	0.3	103	201	17
1965	205 836	84	0.04	38	41	5
1966	438 291	422	0.1	196	207	19
1967	604 888	117	0.02	54	61	2
1968	213 503	17	0.008	15	2	-
1969	178 322	105	0.06	104	1	-
1970	101 276	159	0.2	159	-	-
1971	72 921	225	0.3	225	-	-
1972	47 500	182	0.4	182	-	-
1973	42 342	417	1.0	417	-	-
1974	35 015	291	0.8	291	-	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1966	319	66 839	21.0	7	4	1	1	1	-	-	-	1	6	-
1967	371	97 632	26.3	10	-	1	9	-	-	-	-	10	-	-
1968	3 321	386 692	11.6	1	-	1	-	-	-	-	-	-	-	1
1969	3 443	395 013	11.5	11	2	8	-	-	1	-	-	2	-	9
1970	280	69 988	25.0	-	-	-	-	-	-	-	-	-	-	-
1971	287	55 466	19.3	2	1	-	-	-	-	-	1	2	-	-
1972	310	45 964	14.8	-	-	-	-	-	-	-	-	-	-	-
1973	271	38 473	14.2	1	-	-	1	-	-	-	-	1	-	-
MAINTENANCE PHASE AREAS														
1968	208	55 007	26.4	3	-	1	2	-	-	-	-	2	1	-
1969	212	56 360	26.6	8	-	-	-	8	-	-	-	8	-	-
1970	3 593	456 957	12.7	2	1	-	1	-	-	-	-	2	-	-
1971	3 676	386 209	10.5	50	-	3	31	3	3	2	8	43	1	6
1972	3 924	298 858	7.6	79	3	4	70	-	-	2	-	79	-	-
1973	4 109	294 065	7.3	151	12	-	78	5	-	3	53	151	-	-
1974	4 408	317 695	7.2	229	23	-	148	2	-	5	51	229	-	-

a) June-December.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



ECUADOR

	Population (thousands)	Area km^2
TOTAL COUNTRY	6 501	291 906
Non malarious areas	2 499	116 444
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 697	27 797
Attack phase	2 305	147 665
Total originally malarious areas	4 002	175 462

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	3	614	617
Evaluation operations	14	168	182
Administrative and other	3	76	79
Transport	-	70	70
Total	20	928	948

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	47	-	49	96
Two-wheel vehicles	-	45	-	45
Boats	27	14	-	41
Animals	270	15	4	289
Other	1	-	-	1
Total	345	74	53	472

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	Mar-57-Mar. 58	1st + 2nd	42 418	63 284	1st	244 304	257 697	1 587 866	1 777 566	590	114	8.0
2nd	Apr. 58-Mar. 59	3rd	48 104	50 089	2nd	280 832	144 069	1 047 229	1 078 629	490	123	6.9
		4th	48 391	83 018			127 348	980 474	1 092 450	436	169	8.5
3rd	Apr. 59-Mar. 60	5th	76 577	72 370	3rd[a]	260 539	135 187	949 386	952 664	399	119	9.3
		6th	76 577	97 790[a]			136 542[a]	995 761	1 128 111	403	122	8.8
(b)	Apr. 60-Dec. 60	(b)	251 768	227 411	-	-	-	1 016 387	918 151	424	-	8.9
4th	Jan. 61-Dec. 61	7th	403 989	394 246	-	-	-	1 954 095	1 907 065	446	-	8.4
		8th	413 951	412 008				1 897 137	1 888 183	502		8.5
5th	Jan. 62-Dec. 62	9th	438 027	428 269	-	-	-	2 069 240	2 023 097	529	-	8.4
		10th	448 716	428 329				2 119 734	2 023 430[c]	557		8.2
6th	Jan. 63-Dec. 63	11th	400 362	409 722	-	-	-	2 360 935	2 416 436	581	-	8.2
		12th	363 437	363 304				1 553 330	1 552 883	602		8.2
7th	Jan. 64-Dec. 64	13th	374 284	362 930	-	-	-	1 829 500	1 774 020	620	-	7.8
		14th	367 377	357 206				1 606 760	1 562 305	630		7.9
8th	Jan. 65-Dec. 65	15th	343 390	328 679	-	-	-	1 494 330	1 430 345	627	-	7.5
		16th	330 691	316 519				1 453 023	1 390 756	570		7.7
9th	Jan. 66-Dec. 66	17th	186 353	160 889[d]	-	-	-	783 316	676 293	480	-	7.4
		18th	47 478	33 934				193 473	138 300	484		7.3
10th	Jan. 67-Oct. 67	19th	375 411	8 524[e]	-	-	-	...	43 856	519	-	6.2
		20th	375 411	6 308[e]				...	37 359	547		6.1
11th	Jan. 68-Jan. 69	21st	96 429	91 538[f]	-	-	-	412 868	391 841	551	-	5.8
		22nd	254 234	239 429[f]				1 247 637	1 103 686	479		6.8
12th	Feb. 69-Jan. 70	23rd	321 655	308 631[e]	-	-	-	1 496 262	1 405 607	573	-	7.4
		24th	352 330	339 908[e]				1 527 804	1 509 280	603		7.8
13th	Jan. 70-Dec. 70	25th	359 494	339 793[e]	-	-	-	1 623 163	1 563 261	605	-	7.5
		26th	346 930	328 728[e]				1 595 285	1 389 097	610		7.5
14th	Jan. 71-Dec. 71	27th	378 822	346 973[e]	-	-	-	1 716 064	1 571 166	638	-	7.2
		28th	377 765	283 821[e]				1 710 668	1 265 185	650		7.2
15th	Jan. 72-Dec. 72	29th	360 980	276 096	-	-	-	1 586 310	1 222 343	652	-	7.2
		30th	160 998	153 605	1st[g]	197 132[g]	181 697[g]	713 221	654 140	640	336[g]	6.7
16th	Jan. 73-Dec. 73	31st	348 020	250 997[e]	...	173 981[h]	74 843[h]	1 566 090	1 127 051	629	624[h]	6.8
		32nd	188 708	138 853[e]				845 499	616 091	661		6.7
17th	Jan. 74-Dec. 74	33rd	183 207	113 685	...	159 590	68 594[h]	1 067 765	512 733	403	471[h]	7.3
		34th	186 321	120 046					541 875	484		7.5

a) Cycle suspended. b) Emergency spraying. c) Estimated. d) Not included 21 533 supplementary house-sprayings. e) Not included focal sprayings. f) Not included 39 527 houses sprayed in consolidation areas. g) Cycle of DDT - 1 g. per m^2. h) Annual cycle started in October.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

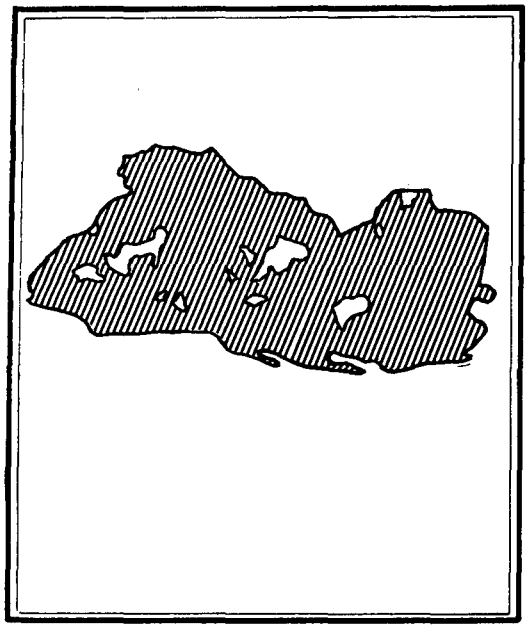
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1957	38 631	1 675	4.3	864	808	3
1958	65 521	4 421	6.7	2 411	2 006	4
1959	98 977	5 887	5.9	2 313	3 571	3
1960	119 562	9 084	7.6	3 158	5 906	20
1961	213 169	9 733	4.6	1 489	8 243	1
1962	269 004	5 531	2.1	658	4 868	5
1963	199 675	3 760	1.9	231	3 509	20
1964	174 203	4 246	2.4	251	3 994	1
1965	160 840	3 731	2.3	178	3 553	-
1966	151 467	4 315	2.8	177	4 138	-
1967a)	147 476	9 077	6.2	688	8 389	-
1968	198 791	32 383	16.3	3 878	28 493	12
1969	256 852	44 038	17.1	3 849	40 183	6
1970	218 663	24 076	11.0	2 571	21 497	8
1971	170 848	8 481	5.0	881b)	7 599	1
1972	214 347	6 226	2.9	711	5 515	-
1973	240 116	6 101	2.5	774	5 328	-
1974	191 706	5 187	2.7	986	4 193	8

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1963	927	86 778	9.4	97	-	-	-	97	-	-	-	6	90	1
1964	1 053	140 497	13.3	382	36	3	-	198	-	9	136	13	369	-
1965	1 288	179 287	13.9	448	72	20	6	278	1	18	53	25	423	-
1966	1 327	160 354	12.1	661	128	7	-	224	-	23	279	229	432	-
1967a)	1 336	142 184	10.6	1 688	147	1	-	429	-	10	1 101	268	1 420	-
1968	1 376	151 392	11.0	4 660	190	3	-	1 369	-	8	3 090	318	4 342	-
1969	1 294	164 798	12.7	6 919	479	40	1	2 567	2	88	3 742	468	6 451	-
1970	1 286	142 216	11.1	4 299	318	75	3	948	-	52	2 903c)	257b)	4 042	-
1971	1 325	112 266	8.5	690	145	-	1	297	-	8	293c)	28b)	662	-
1972	1 520	107 264	7.1	483	113	1	-	152	-	12	205	16b)	466	-
1973	1 644	134 035	8.2	708	334	6	-	135	1	9	223	240	468	-
1974	1 697	122 979	7.2	294	125	-	-	142	1	1	25	17	277	-

a) Figures for November not separated by phase. b) Includes mixed infections. c) Includes cryptic cases.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



	EL SALVADOR Population (thousands)	Area km^2
TOTAL COUNTRY	3 932	21 149
Non malarious areas	570	2 494
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	3 362	18 655
Total originally malarious areas	3 362	18 655

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	232	233
Evaluation operations	1 (4)	203	204 (4)
Administrative and other	1	27	28
Transport	-	45	45
Total	3 (4)	507	510 (4)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	16	14	11	41
Two-wheel vehicles	-	12	-	12
Boats	-	-	-	-
Animals	-	-	-	-
Other	-	-	-	-
Total	16	26	11	53

EL SALVADOR (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Propoxur							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Propoxur	
3rd	Aug. 58-Jul. 59[a]	5th	331 975	273 788	-	-	-	1 575 885	1 299 671	493	-	8.6
		6th	341 277	270 719	-	-	-	1 620 050	1 285 197	527	-	8.9
4th	Aug. 59-Jul. 60	7th	261 102	265 361	-	-	-	1 237 362	1 257 537	573	-	7.7
		8th	278 991	276 050	-	-	-	1 289 775	1 277 428	545	-	7.7
5th	Aug. 60-Jun. 61	9th	281 430	279 481	-	-	-	1 360 400	1 297 262	528	-	7.6
		10th	368 841	371 715	-	-	-	1 700 000	1 713 252	526	-	8.9
6th	Jul. 61-Jul. 62	11th	380 283	377 551	-	-	-	1 748 922	1 736 431	546	-	9.2
		12th	387 944	386 094	-	-	-	1 742 645	1 734 366	562	-	9.5
(b)	Aug. 62-Feb. 63	(b)	3 901	3 816	-	-	-	20 117	19 680	809	-	6.7
7th	Mar. 63-Dec. 63	13th	267 239	270 703	-	-	-	1 206 851	1 222 430	559	-	9.3
		14th	273 344	165 666	-	-	-	1 255 742	761 151	506	-	9.3
8th	Jan. 64-Nov. 64	15th	127 000	125 854	-	-	-	581 745	576 496	536	-	8.4
		16th	125 806	114 441	-	-	-	577 568	525 392	533	-	9.4
(c)	Dec. 64-Feb. 66	(c)	-	6 396	-	-	-	-	...	-	-	-
9th	Mar. 66-Dec. 66	17th	203 812	175 158	-	-	-	939 492	807 413	602	-	8.1
		18th	203 812	126 954	-	-	-	928 853	578 583	562	-	8.7
10th	Feb. 67-Ene. 68	19th	366 344	252 243	-	-	-	1 685 182	1 146 489	596	-	8.4
		20th	366 343	180 101	-	-	-	1 465 372	770 012	551	-	8.9
11th	Feb. 68-Dec. 68	21st	318 723	314 565	-	-	-	1 441 928	1 402 421	588	-	8.6
		22nd	324 888	318 408	-	-	-	1 454 112	1 409 950	562	-	9.4
12th	Feb. 69-Dec. 69	23rd	334 576	328 778	-	-	-	1 603 899	1 443 932	575	-	8.4
		24th	335 126	346 004	-	-	-	1 714 893	1 995 751	513	-	9.2
13th	Jan. 70-Dec. 70	25th	283 480	273 886	1st	16 832	16 151	1 361 790	1 332 517	458	270	10.1
		26th	269 983	264 597	2nd	16 655	15 707	1 312 696	1 309 710	450	277	10.3
14th	Mar. 71-Dec. 71	27th	69 344	68 004	1st	45 757	43 058	323 981	316 765	450	292	10.0
		28th	69 082	56 104	2nd	46 072	43 738	323 981	254 388	453	319	10.3
					3rd	46 072	16 764				339	
15th	Jan. 72-Dec. 72	29th	91 600	89 051	4th-5th	123 042	118 519[d]	435 644	426 143	472	346	9.9
		30th	91 600	89 438	6th-7th	123 042	124 838[d]	435 644	426 630	476	345	10.8
16th	Jan. 73-Dec. 73	31st	4 283	3 660	8th-9th	132 584	125 360[e]	673 644	632 842	570	340	7.6
		32nd	4 283	3 130	10th-11th	132 584	125 877[e]	673 644	635 060	562	339	7.6
17th	Jan. 74-Dec. 74	33rd	4 447	3525	1st-2nd	134 054	95 697[f]	22 025	17 866	580	339.8	8.0
		34th	4 447	538	3rd-4th	188 142	173 943[f]	22 025	2 654	624	340.3	7.8

a) Date in which DDT started to be used; prior to that DDT and dieldrin were used. b) Spraying discontinued; only one locality was sprayed. c) Emergency spraying. d) In addition, 298 746 houses were sprayed with propoxur. e) 381 314 houses were partially sprayed with propoxur in 10 cycles carried through by the SNEM; and 43 173 houses in 9 cycles carried through by AMRO-0216. f) 134 803 houses were also sprayed in 4 cycles of 35 days.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

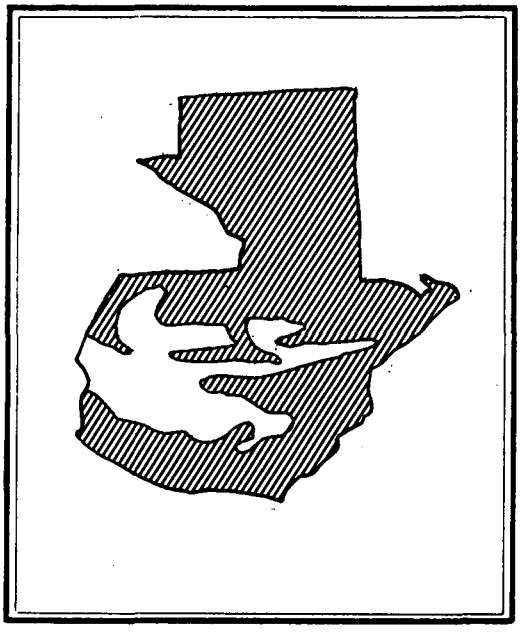
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
1957	29 171	6 661	22.8	3 001	3 655	5
1958	51 615	9 351	18.1	4 419	4 932	-
1959	71 295	17 521	24.6	4 051	13 470	-
1960	75 381	10 012	13.3	2 947	7 064	1
1961	127 293	12 563	9.9	2 965	9 594	4
1962	194 069	15 433	7.9	2 556	12 873	4
1963	238 791	17 846	7.5	1 879	15 962	5
1964	350 843	25 857	7.4	2 661	23 195	1
1965	506 442	34 070	6.7	2 186	31 884	-
1966	533 047	68 562	12.9	10 703	57 859	-
1967	535 494	82 960	15.5	7 226	75 734	-
1968	692 671	31 526	4.5	968	30 558	-
1969	858 916	25 299	2.9	1 955	23 344	-
1970	572 373	45 436	7.9	4 202	41 234	-
1971	414 331	46 858	11.3	3 234	43 623	1
1972	394 935	38 335	9.7	3 059	35 276	-
1973	393 110	35 095	8.9	7 286	27 809	-
1974	478 553	66 691	13.9	13 132	53 558	1

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1968 b)	505 b)	112 640	22.3	4 305	487	592	47	773	-	-	2 406	55	4 250	-

a) Includes mixed infections. b) Beginning 1969 this area was brought to attack phase.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



GUATEMALA

	Population (thousands)	Area km^2
TOTAL COUNTRY	5 347	108 889
Non malarious areas	3 066	28 539
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	2 281	80 350
Total originally malarious areas	2 281	80 350

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	502	502
Evaluation operations	2	193	195
Administrative and other	-	49	49
Transport	-	54	54
Total	2	798	800

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	35	6	55	96
Two-wheel vehicles	53	88	1	142
Boats	4	2	8	14
Animals	66	-	-	66
Other	-	-	-	-
Total	158	96	64	318

GUATEMALA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Propoxur							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Propoxur	
3rd[a]	Oct. 58-Oct. 59	1st	341 000	301 329				1 482 670	1 310 317	427		8.8
		2nd	342 586	357 104				1 481 342	1 544 144	542		7.5
4th	Nov. 59-Nov. 60	3rd	373 641	368 269				1 460 936	1 439 781	541		7.1
		4th	377 381	378 636				1 654 816	1 660 207	560		8.1
5th	Dec. 60-Dec. 61	5th	396 588	386 737				1 815 183	1 769 971	588		7.8
		6th	406 807	393 090				1 737 473	1 678 906	557		7.9
6th	Jan. 62-Jan. 63	7th	375 000	368 135				1 562 625	1 534 089	553		7.5
		8th	291 490	280 687				1 185 781	1 141 867	589		7.5
7th	Feb. 63-Jan. 64	9th	243 511	231 824				949 936	904 382	537		7.6
		10th	175 000	171 061				642 950	628 563	502		8.0
8th	Feb. 64-Jan. 65	11th	205 686	193 780				748 945	705 594	510		8.1
		12th	239 819	239 859				1 060 576	1 060 758	508		8.0
9th	Feb. 65-Mar. 66	13th	281 102	268 636[b]				1 067 260	1 019 937	506		8.2
		14th	165 071	162 100[c]				697 340	685 083	523		8.3
10th	Apr. 66-Feb. 67	15th	282 310	192 058				1 039 183	706 972	557		7.8
		16th	...	15 693				...	129 536	542		7.7
11th	Feb. 67-Mar. 68	1st[d]	478 038	468 963				1 912 152	1 778 666	550		7.7
		2nd	511 193	467 976				1 891 414	1 793 133	531		7.8
12th	Apr. 68-Mar. 69	3rd	500 444	443 408				1 814 885	1 727 243	545		7.7
		4th	416 861	378 313				1 499 045	1 439 806	544		7.6
13th	Apr. 69-Mar. 70	5th	379 477	350 848				1 346 643	1 354 349	535		7.7
		6th	382 532	352 988				1 348 215	1 321 466	540		7.7
14th	Apr. 70-Dec. 70	7th	397 810	326 349				1 311 312	1 197 406	529		7.8
		8th	216 798	110 575[e]				721 685	360 346	497		7.8
15th	Jan. 71-Dec. 71	9th	166 365	151 520	1st	56 338	49 078	549 680	530 588[f]	507	225	7.8
		10th	167 440	158 800	2nd	61 941	57 674	543 661	543 664	507	242	7.8
					3rd	60 783	59 071				232	
16th	Jan. 72-Dec. 72	11th	144 441	161 928[g]	4th-5th	128 722	124 295	488 851	473 234[f]	490	251	7.5
		12th	140 956	163 532[g]	6th-7th	140 195	134 503	470 640	471 528[f]	487	256	7.4
17th	Jan. 73-Dec. 73	13th	160 853	153 370[g]	8th-9th	177 253	166 956	515 641	519 377[f]	492	245	7.7
		14th	139 553	134 154[g]	10th-11th	206 731	192 830	461 428	473 072[f]	490	230	7.6
18th	Jan. 74-Dec. 74	15th	140 021	120 292[g]	12th-13th	205 212	187 715	462 150	419 996[f]	505	236	7.6
		16th	141 699	117 714[g]	14th-15th	182 687	157 854	478 610	409 913[f]	494	223	7.3

a) Previous coverage with dieldrin. b) 115 204 houses were sprayed in annual cycles and 3 908 in emergency sprayings. c) Includes 5 791 houses sprayed in emergency sprayings. d) First cycle of 3-Year Plan. e) Includes 8 197 houses sprayed in two quarterly cycles. f) Does not include population protected with propoxur. g) Includes houses sprayed in quarterly cycles.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

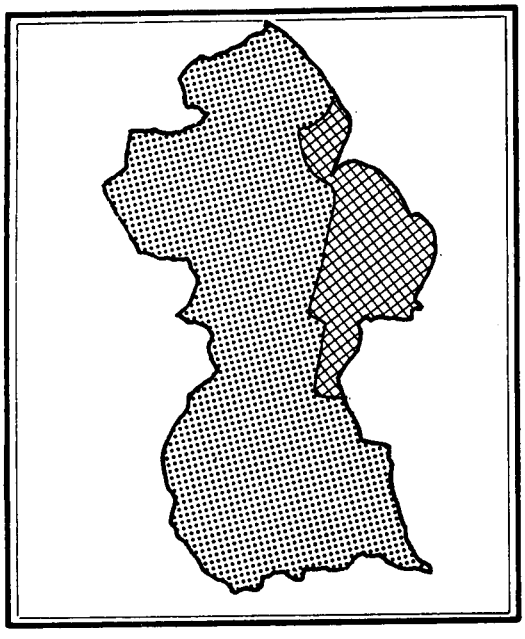
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1956a)	8 030	2 111	26.3	538	1 573	-
1957	25 232	5 653	22.4	1 837	3 812	4
1958	62 119	12 829	20.6	5 043	7 786	-
1959	108 048	7 894	7.3	1 548	6 346	-
1960	129 741	3 387	2.6	417	2 969	1
1961	219 628	4 083	1.9	780	3 298	5
1962	275 003	5 783	2.1	1 539	4 224	20
1963	191 795	11 810	6.2	4 529	7 244	37
1964	165 263	16 981	10.3	4 255	12 693	33
1965	242 012	11 730	4.8	2 053	9 676	1
1966	352 046	21 371	6.1	3 189	18 179	3
1967	439 192	19 684	4.5	1 377	18 306	1
1968	492 940	10 407	2.1	360	10 047	-
1969	521 336	10 494	2.0	202	10 291	1
1970	447 706	11 044	2.5	81	10 963	-
1971	332 531	8 280	2.5	33	8 246	1
1972	345 156	7 750	2.2	4	7 746	-
1973	386 026	6 182	1.6	3	6 179	-
1974	421 240	4 030	1.0	25	4 005	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1962	581	48 370	8.3	213	2	-	-	100	-	-	111	62	151	-
1963	1 234	157 071	12.7	3 306	178	142	-	554	-	2	2 430	1 028	2 266	12
1964	1 057	123 795	11.9	3 420	154	335	-	511	-	1	2 419	748	2 665	7
1965	887	138 550	15.6	2 742	296	272	-	111	-	-	2 063	260	2 481	1
1966 b)	845	24 393 c)	11.5	674	81	29	1	9	-	-	554	38	636	-

a) August-December. b) Beginning April, consolidation areas reclassified to attack phase. c) January-March.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



GUYANA

	Population (thousands)	Area km^2
TOTAL COUNTRY	803	215 025
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	754	39 437
Consolidation phase	49	175 588
Attack phase	-	-
Total originally malarious areas	803	215 025

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	9 (2)	9 (2)
Evaluation operations	1	52 (3)	53 (3)
Administrative and other	-	3	3
Transport	-	20	20
Total	1	84	85 (5)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	...	...	...	...
Two-wheel vehicles	...	...	...	...
Boats	...	...	...	...
Animals	...	...	...	...
Other	...	...	...	...
Total	...	...	...	...

GUYANA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)	Average houses sprayed per spray-man/day
		Once a year			Twice a year						
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	
...	Jan. 61-Dec. 61	...	16 538	15 107	-	-	-	82 062	74 964	195	4.6
...	Jan. 62-Dec. 62	...	9 542	10 273	...	6 131	13 535	76 563	116 305	183	8.3
...	Jan. 63-Sep. 63	...	6 726	4 270	...	7 218	7 961	68 123	59 542	346	7.3
...	Jan. 64-Dec. 64	...	6 563	5 408	...	4 236 4 236	5 280 2 384	63 243	54 986	295	4.3
...	Jan. 65-Dec. 65	...	6 358	4 361	...	2 341 2 341	2 759 4 001	46 000	47 467	227	4.6
...	Feb. 66-Dec. 66	...	8 217	718	...	3 889 4 619	4 833 3 067	70 362	36 256	461	4.3
...	Feb. 67-Dec. 67	...	-	-	...	... ...	5 075 4 167	... ...	20 972 18 192	318	6.2
...	Jan. 68-Dec. 68	-	-	-	...	12 304 5 979	7 094 5 414	35 053 27 723	35 053 22 606	199	6.5
...	Feb. 69-Dec. 69	-	-	-	...	6 542	5 477	32 033	22 971	310	5.8
...	Feb. 70-Dec. 70	-	3 267	2 883	-	-	-	38 674	11 063	234	5.6
...	Feb. 71-Dec. 71	-	4 500	3 049	-	-	-	14 400	13 011	300	5.7
...	Feb. 72-Dec. 72	-	2 675	2 135	-	3 760	2 635	15 460	11 144	285	7.4
...	Feb. 73-Dec. 73	-	...	4 191	-	4 102	5 152	...	39 706	339	7.3
...	Feb. 74-Dec. 74	-	2 233	1137	-	2 192 2 192	393 1 146	27 503	12 870	243	10.4

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

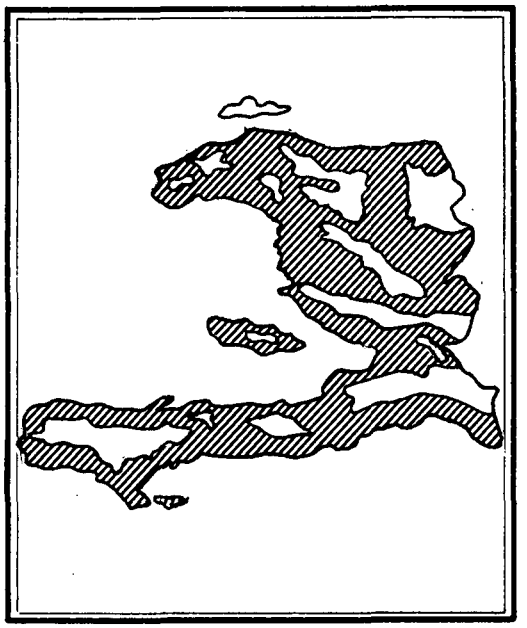
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958	1 520	51	3.36	23	8	20
1959	3 754	176[a]	4.69	53	100	13
1960	3 674	263[a]	7.16	175	67	12
1961	15 515	218	1.41	57	156	5
1962	14 358	425	2.96	266	159	-
1963	16 780	473[a]	2.82	414	56	-
1964	35 091	223	0.64	190	33	-
1965	22 950	25	0.11	24	1	-
1966	14 098	17	0.12	15	2	-
1967	21 389	175	0.82	145	29	1
1968	32 064	44	0.14	20	24	-
1969	47 966	12	0.03	12	-	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1965	26	15 500	59.6	1	1	-	-	-	-	-	-	-	1	-
1966[b]	30	22 141	73.8	882	...	...	...	...	...	...	...	-	882	-
1970	43	45 986	107.0	17	-	-	15	-	-	-	2	9	8	-
1971	44	51 183	116.2	26	11	-	12	-	-	13	-	17	8	1
1972	46	51 632	112.2	263	230	-	23	-	-	-	-	145	118	-
1973	48	51 344	107.0	42	34	1	-	5	-	-	1	4	38	-
1974	49	34 241	69.9	68	41	1	26	-	-	-	-	63	5	-
MAINTENANCE PHASE AREAS														
1958	430	1	0.0	-	-	-	-	-	-	-	-	-	-	-
1959	460	-	0	-	-	-	-	-	-	-	-	-	-	-
1960	494	-	0	-	-	-	-	-	-	-	-	-	-	-
1961	515	1 374	0.3	13	-	-	1	12	-	-	-	1	12	-
1962	556	21 088	3.8	21	17	3	-	1	-	-	-	-	21	-
1963	572	15 475	2.7	3	-	2	1	-	-	-	-	1	2	-
1964	589	20 094	3.4	2	-	-	2	-	-	-	-	2	-	-
1965	602	23 057	3.8	2	-	-	1	-	-	1	-	2	-	-
1966	627	17 430	2.8	11	...	...	...	...	...	...	...	1	10	-
1967	637	12 774	2.0	-	-	-	-	-	-	-	-	-	-	-
1968	658	23 153	3.5	17	-	-	-	17	-	-	-	7	10	-
1969	678	22 155	3.3	7	-	-	1	6	-	-	-	1	6	-
1970	671	17 637	2.6	1	-	-	-	-	-	-	1	-	1	-
1971	691	14 829	2.1	1	-	-	1	-	-	-	-	-	1	-
1972	711	8 299	1.2	3	-	-	2	-	-	-	1	2	1	-
1973	732	5 076	0.7	0	-	-	-	-	-	-	-	-	-	-
1974	754	8 308	1.1	4	-	-	2	-	-	-	2	4	-	-

a) Includes undifferentiated mixed infections. b) The area previously in attack was transferred to Consolidation in 1970

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



HAITI

	Population (thousands)	Area km^2
TOTAL COUNTRY	5 318	27 750
Non malarious areas	1 391	8 650
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	3 927	19 100
Total originally malarious areas	3 927	19 100

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	3	54	57
Evaluation operations	10	355	365
Administrative and other	2	68	70
Transport	-	38	38
Total	15	515	530

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	156	-	-	156
Two-wheel vehicles	-	-	-	-
Boats	2	-	-	2
Animals	-	-	-	-
Other	-	-	-	-
Total	158	-	-	158

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
1st	Jan. 62-Dec. 62	1st	952 301	885 549 a)	3 490 183	3 245 821	220	14. 3
		2nd	929 415	906 846	3 311 505	3 231 438	196	16. 6
2nd	Jan. 63-Dec. 63	3rd	940 397	902 687	3 297 032	3 165 209	217	15. 4
		4th	964 942	914 340	3 186 238	3 019 259	235	16. 2
3rd	Jan. 64-Dec. 64	5th	984 853	974 136	3 317 674	3 281 609	243	16. 1
		6th A b)	457 066	454 029	1 459 549	1 449 893	127	16. 8
		6th B b)	465 260	455 353	1 446 450	1 446 458	122	17. 5
4th	Jan. 65-Jan. 66	7th A b)	465 907	246 414	1 447 900	765 795	119	18. 3
		7th B c)	465 907	404 692	1 477 205	1 283 123	234	17. 9
		8th A d)	5 657	5 418	21 175	20 280	487	9. 9
		8th B d)	8 178	8 048	27 951	27 508	254	14. 2
5th	Feb. 66-Dec. 66	9th	865 000	772 513	2 881 920	2 573 852	237	14. 8
6th	Jul. 67-Dec. 67	11th	360 049	233 513	...	720 525	295	15. 8
7th	Jul. 68- Jan. 69	12th	647 728	639 266	2 452 000	2 188 271	258	14. 8
		13th	124 814	121 119	452 000	271 305	234	16. 6
8th	Aug. 69-Dec. 69	14th	595 000	549 869	1 617 000	1 685 059	294	15. 2
9th	Feb. 70-Nov. 70	15th	579 818	576 927	1 637 552	1 687 667	277	15. 5
		16th	799 818	777 773	2 162 437	2 330 412	270	14. 5
10th	Jan. 71-Dec. 71	17th	819 368	801 865	2 318 630	2 246 558	270	13. 8
		18th A	83 353	80 626	200 885	204 444	246	14. 5
		18th B	819 368	814 696	2 325 795	2 278 253	265	13. 6
11th	Jan. 72-Dec. 72	19th	841 613	807 258	2 427 205	2 330 036	274	13. 9
		20th	620 267	603 769	1 764 504	1 764 504	277	13. 7
12th	Jan. 73-Nov. 73	21st-22nd e)	778 983	801 247	2 215 888	2 333 295	287	12. 6
13th	Feb. 74- May. 74	23rd	250 979	246 146	725 566	732 016	298	13.0
	Aug. 74- Nov. 74	24th	255 778	241 512	722 439	699 524	275	12.0

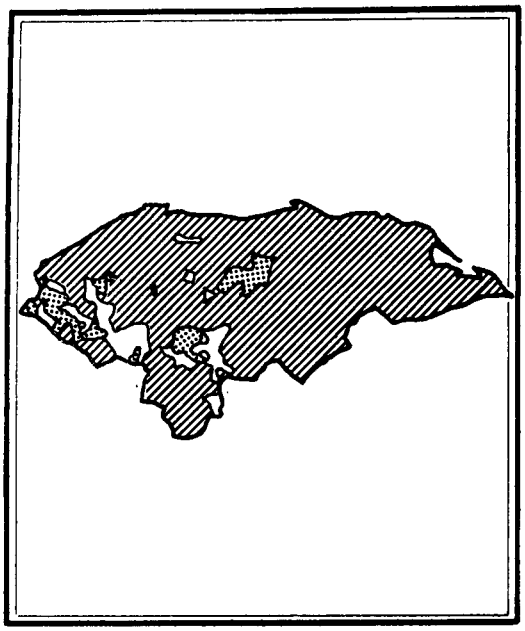
a) 10 016 houses were sprayed with dieldrin. b) Quarterly cycles, using DDT 1g/m^2. c) Quarterly cycles, using DDT 2g/m^2. d) Annual cycles.
e) Includes one semestrial cycle and three quarterly cycles.

HAITI (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1962	111 142	4 033	3.6	3 441	20	572
1963	386 657	6 662	1.7	5 464	12	1 186
1964	473 297	19 170	4.1	18 422	24	724
1965	752 284	10 304	1.4	9 997	20	287
1966	2 239 469	8 378	0.4	8 208	35	135
1967	1 343 796	4 871	0.4	4 840	3	28
1968	1 173 905	2 562	0.2	2 556	3	3
1969	686 167	5 005	0.7	4 999	1	5
1970	357 366	10 658	3.0	10 654	-	4
1971	270 695	11 347	4.2	11 345	2	-
1972	313 368	25 961	8.3	25 961	-	-
1973	309 482	22 858	7.4	22 875	-	1
1974	357 546	25 441	7.1	25 441	-	-

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



HONDURAS

	Population (thousands)	Area km^2
TOTAL COUNTRY	2 866	112 088
Non malarious areas	362	17 860
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	484	7 123
Attack phase	2 020	94 228
Total originally malarious areas	2 504	101 351

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	205	205
Evaluation operations	1	86	87
Administrative and other	14	35	49
Transport	2	33	35
Total	17	359	376

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	46	25	11	82
Two-wheel vehicles	-	60	1	61
Boats	-	-	2	2
Animals	-	30	-	30
Other	-	-	-	-
Total	46	115	14	175

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Malathion							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Malathion	
1st	Jul. 59-Jun. 60	1st 2nd	232 771 241 726	236 963 242 059	-	-	-	1 252 773 1 277 280	1 275 237 1 279 148	406 368	-	9.8 11.4
2nd	Jul. 60-Jun. 61	3rd 4th	245 572 258 519	254 699 265 825	-	-	-	1 274 028 1 314 052	1 321 450 1 351 212	369 419	-	11.8 10.9
3rd	Jul. 61-Jun. 62	5th 6th	276 458 287 516	277 941 285 394	-	-	-	1 401 919 1 421 192	1 409 325 1 410 773	360 262	-	11.1 11.3
4th	Jul. 62-Jun. 63	7th 8th	282 186 187 905	290 056 191 321	-	-	-	1 376 785 877 892	1 415 286 893 861	373 377	-	11.1 11.0
5th	Jul. 63-Aug. 64	9th 10th	126 499 14 851	110 612 27 719	1st 2nd 3rd	19 776 17 471 21 499	20 440 18 286 23 066	781 085 171 805	712 355 240 031	404 505	440 343 575	10.5 9.0
6th	Sep. 64-Jun. 65	11th 12th	21 502 30 377	37 818 35 603	4th 5th -	23 274 22 039 -	23 614 24 997 -	328 950 137 790	425 513 161 522	567 474	550 411 -	8.4 8.7
7th	Jul. 65-Jun. 66	13th 14th	38 035 59 178	54 654 38 187	-	-	-	182 636 291 630	262 338 188 187	464 481	-	8.9 8.8
8th	Jul. 66-Jun. 67	15th 16th	76 185 113 469	79 491 83 915	-	-	-	375 410 544 651	391 701 410 160	441 490	-	8.4 8.2
9th	Jul. 67-Jun. 68	17th 18th	164 594 181 273	189 567 181 190	-	-	- 3 957[a]	806 510 891 863	1 015 546 891 903	500 475	-	7.4 8.5
10th	Jul. 68-Jun. 69	19th 20th	186 143 191 937	186 861 195 462	-	-	10 060[a] 6 109[a]	915 823 977 310	918 403 932 976	482 449	-	8.5 8.1
11th	Jul. 69-Dec. 69	21st	171 288	164 954	-	-	8 670[a]	856 440	795 210	349	-	8.0
12th	Jan. 70-Dec. 70	22nd	190 386	191 383[b]	-	44 706	48 673[c]	951 930	928 051	401	-	7.8
13th	Jan. 71-Dec. 71	23rd 24th	22 997 22 900	22 479 23 416	1st-3rd[d]	107 641	104 641[d]	111 108 110 752	108 752[e] 113 180[e]	419 391	-	8.8 9.7
14th	Jan. 72-Dec. 72	25th 26th	93 575 155 709	89 493[f] 158 367[g]	4th-7th	142 226	137 032[d]	451 493[f] 748 497[g]	461 392[f] 781 962[g]	412 404	-	8.1 9.3
15th	Jan. 73-Dec. 73	27th 28th	107 878 111 335	109 329[h] 110 710[h]	8th-9th 10th-11th	71 187 73 055	68 842[i] 69 614[i]	516 073 523 915	525 698 530 961	383 372	- -	9.5 9.7
16th	Jan. 74-Aug. 74	1st-1974	142 404	58 103[j]	...	43 864	32 906[i]	677 787	222 079	346	-	9.0

a) Emergency spraying with DDT. b) Does not include 8 394 emergency sprayings. c) Two quarterly cycles with DDT. d) Total houses sprayed in four quarterly cycles with Propoxur. e) 538 631 inhabitants were protected with sprayings of Propoxur. f) Includes 44 881 houses sprayed in one cycle from April/Dec. and 25 053 in semestrial cycle in "Valle de Sula." h) Includes semestrial spraying in "Valle de Sula but does not include 47 105 houses sprayed in annual cycle. i) Includes houses sprayed with Propoxur in Marcovia. j) Includes sprayings in Valle de Sula.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
1958 b)	14 183	906	6.4	339	567	-
1959	66 391	6 675	10.1	3 170	3 504	1
1960	109 677	5 517	5.0	1 737	3 780	-
1961	164 965	4 334	2.6	861	3 472	1
1962	229 666	5 747	2.5	597	5 150	-
1963	168 647	6 721	4.0	669	6 052	-
1964	75 286	5 392	7.2	604	4 788	-
1965	113 763	5 082	4.5	141	4 941	-
1966	165 563	13 299	8.0	1 146	12 153	-
1967	296 498	14 324	4.8	832	13 492	-
1968	359 674	13 337	3.7	3 897	9 440	-
1969	432 895	28 318	6.5	5 144	23 174	-
1970	321 763	33 926	10.5	5 534	28 392	-
1971	237 398	47 913	20.2	4 358	43 555	-
1972	206 203	18 381	8.9	587	17 794	-
1973	205 258	8 649	4.2	229	8 420	-
1974	266 052	7 383	2.8	148	7 235	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum (a)	P. vivax	P. malariae
							from abroad	from areas within country						
1962 c)	46	9 989 c)	43.4	3	-	1	-	2	-	-	-	-	3	-
1963	941	95 484	10.1	356	177	51	1	84	-	-	43	19	337	-
1964	1 631	131 696	8.1	1 281	711	258	-	143	-	-	169	37	1 244	-
1965	1 518	196 538	13.0	1 870	1 010	222	32	111	-	-	495	22	1 848	-
1966	1 563	195 239	12.5	3 816	1 178	193	16	156	-	-	2 273	58	3 758	-
1967	1 091	169 100	15.5	1 828	814	223	47	304	-	-	440	40	1 788	-
1968	1 124	225 022	20.0	2 329	1 015	147	31	242	-	-	894	384	1 945	-
1969	648	158 649	24.5	1 266	552	60	33	95	-	-	526	229	1 037	-
1970	423	35 673	8.4	611	181	23	-	147	-	-	260	71	540	-
1971	437	18 375	4.2	673	59	93	-	181	2	-	338	86	587	-
1972	451	20 376	4.1	270	40	28	2	46	-	-	154	65	205	-
1973	468	20 973	4.5	213	24	2	1	30	-	-	156	7	204	2
1974	484	21 790	4.5	120	15	-	2	19	-	-	84	2	118	-

a) Includes mixed infections. b) Incomplete information. c) July-December.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

MEXICO

	Population (thousands)	Area km^2
TOTAL COUNTRY	56 495	1 967 183
Non malarious areas	28 402	817 183
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	13 347	424 694
Attack phase	14 746	725 306
Total originally malarious areas	28 093	1 150 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	50	4 056	4 106
Evaluation operations	69	1 308	1 377
Administrative and other	43	556	599
Transport	18	230	248
Total	180	6 150	6 330

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	706	46	711	1 463
Two-wheel vehicles	-	-	-	-
Boats	20	20	5	45
Animals	2 179	158	-	2 337
Other	-	-	-	-
Total	2 905	224	716	3 845

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	Jan. 57-Dec. 57	1st	2 292 841	2 143 023	1st	(a)	219 662	10 464 526	10 802 292	495	99	9.3
		2nd	2 434 486	2 298 952			459 064	11 113 428	12 597 171	417		9.9
2nd	Jan. 58-Dec. 58	3rd	2 060 985	2 103 570	2nd	731 872	685 814	12 545 513	12 531 599	402	110	10.3
		4th	1 869 911	1 971 557		666 929	531 742	11 362 506	11 212 496	424	113	10.5
3rd	Jan. 59-Dec. 59	5th	2 973 820	3 050 952	3rd	321 520	246 753	14 492 905	14 505 650	434	112	10.8
		6th	3 018 184	3 219 340		160 136	45 548	14 226 160	14 614 270	434	118	10.4
4th	Jan. 60-Dec. 60	7th	3 177 380	3 027 089	4th	68 977	21 390	14 163 856	13 301 924	369	94	10.9
		8th	3 376 695	2 869 083		(a)	1 000	14 681 870	12 481 041	247	83	11.1
5th	Jan. 61-Dec. 61	9th	1 575 106	1 582 503	-	-	-	6 571 342	6 602 052	356	-	11.2
		10th	1 575 106	852 287				6 409 106	3 468 283	414		10.5
6th	Jan. 62-Dec. 62	11th	1 036 386	783 060[b]	-	-	-	4 151 927	3 135 873	514	-	8.6
		12th	1 036 386	825 082				4 070 924	3 241 041	517		8.9
7th	Jan. 63-Dec. 63	13th	1 477 793	1 551 297[b]	-	-	-	5 686 547	5 969 938	512	-	8.6
		14th	1 477 793	1 606 125[b]				5 572 757	6 056 473	...		8.7
8th	Jan. 64-Dec. 64	15th	1 808 906	2 190 136[c]	-	-	-	6 869 682	8 317 653	486	-	8.7
		16th	1 808 906	1 848 155[c]				6 770 916	6 917 988	476		8.7
9th	Jan. 65-Dec. 65	17th	1 770 934	1 824 675[c]	-	-	-	6 278 670	6 469 365	423	-	9.4
		18th	1 770 934	1 812 043[c]				5 949 098	6 087 346	408		9.3
10th	Jan. 66-Dec. 66	19th	1 842 180	1 874 530[d]	-	-	-	6 482 447	6 596 302	420	-	9.4
		20th	1 842 180	1 839 992[d]				6 202 620	6 195 335	410		9.1
11th	Jan. 67-Dec. 67	21st	1 814 243	1 781 299[d]	-	-	-	6 350 024	6 586 286	407	-	9.2
		22nd	1 814 243	1 734 073[d]				6 350 024	6 217 836	405		9.2
12th	Jan. 68-Dec. 68	23rd	1 613 582	1 611 594	-	-	-	7 321 030	6 088 368	412	-	9.2
		24th	235 852	361 518				1 583 857	946 966	397		8.8
13th	Jan. 69-Dec. 69	25th	1 515 935	1 526 901[e]	-	-	-	5 685 501	5 028 887	482	-	9.3
		26th	407 363	609 871[e]				1 544 842	1 415 511	551		8.6
14th	Jan. 70-Dec. 70	27th	1 791 048	1 735 041[f]	-	-	-	8 955 240	6 742 946	555	-	9.1
		28th	1 991 000	1 931 014[f]				7 763 460	7 570 041	574		8.7
15th	Jan. 71-Dec.71	29th	2 502 750	2 505 614[g]	1st-3rd[h]	275 572[h]	277 719[h]	10 105 493	10 118 755	460	-	8.4
		30th	2 575 269	2 567 322[g]				10 167 400	10 174 222	463		8.5
16th	Jan. 72-Dec.72	31st	2 503 233	2 433 735[g]	1st-3rd[h]	270 940[h]	269 671[h]	9 893 648	9 619 472	521	391[h]	8.3
		32nd	2 256 367	2 261 792[g]				8 803 242	8 825 326	524		8.3
17th	Jan. 73-Dec. 73	33rd	2 336 869	2 327 090 g)	1st-3rdh)	165 197 h)	186 767h)	9 045 060	9 007 813	475	382h)	8.0
		34th	1 762 630	2 322 297g)				6 816 175	9 034 142	475		7.9
18th	Jan. 74-Dec. 74	35th	2 084 065	2 056 518g)	1st-3rd	160 707	184 805[h]	7 890 082	7 786 343	529	384[h]	8.0
		36th	1 583 098	2 056 150g)				6 017 397	7 844 268	531		7.8

a) Included in DDT column. b) Including houses sprayed once and three times a year. c) Including houses sprayed once, three and four times a year. d) Including houses sprayed once and three times a year, and some sprayed with BHC. e) Includes houses sprayed once a year and focal sprayings in consolidation areas. f) Does not include 5 803 inhabitants from Zone V. g) Includes semestrial spraying in consolidation phase areas. h) 4-month cycles with DDT.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive				
		Number	Percentage	P. falciparum a)	P. vivax	P. malariae
1957	175 080	4 387	2. 51	514	3 856	17
1958	399 124	3 290	0. 82	487	2 779	24
1959	815 038	3 202	0. 39	443	2 705	54
1960	1 208 712	3 569	0. 29	245	3 251	73
1961	828 360	8 735	1. 05	337	8 283	115
1962	727 262	9 642	1. 33	139	9 450	53
1963	710 448	12 906	1. 82	279	12 581	46
1964	761 832	11 722	1. 54	371	11 334	17
1965	787 301	8 559	1. 09	44	8 506	9
1966	862 888 b)	10 054 b)	1. 17	79	9 966	9
1967	796 135	13 515	1. 70	41	13 468	6
1968	1 418 672	22 486	1. 59	232	22 134	120
1969	1 497 730	46 743	3. 12	46	46 591	106
1970	1 322 628	57 435	4. 34	3 018	54 374	43
1971	2 218 232	41 167	1. 85	1 500	39 627	40
1972	1 829 488	25 537	1. 40	850	24 653	34
1973	1 949 745	22 403	1. 50	393	22 004	6
1974	1 390 982	25 942	1. 87	57	25 865	20

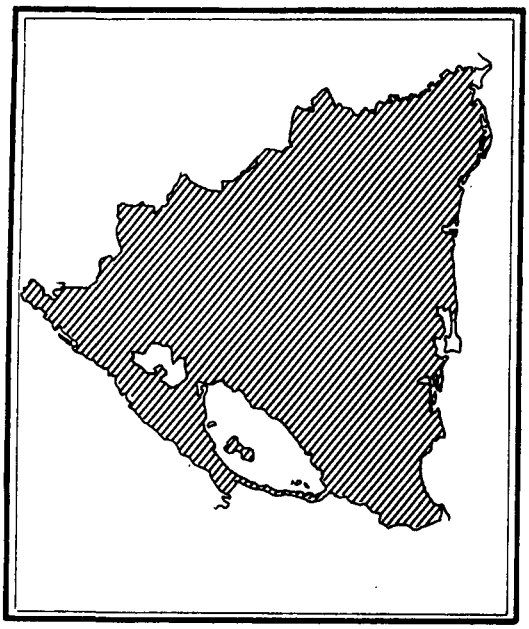
CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1958	59	4 449	7. 5	-	-	-	-	-	-	-	-	-	-	-
1959	59	6 560	11. 1	-	-	-	-	-	-	-	-	-	-	-
1960 c)	70	4 058 c)	7. 7	-	-	-	-	-	-	-	-	-	-	-
1961	11 721	745 907	6. 4	3 114	1 248	446		387	12	90	931	91	3 004	19
1962	15 592	1 240 130	7. 9	4 367	1 211	487	3	695	2	642	1 597	43	4 577	17
1963	16 830	1 122 103	6. 7	3 835	1 514	73	1	494	5	390	1 358	183	3 634	18
1964	12 740	833 491	6. 5	1 683	914	78	2	407	4	11	267	83	1 595	5
1965	12 995	808 202	6. 2	1 554	601	30	9	298	-	21	595	26	1 527	1
1966	12 794	709 154	5. 5	1 158	579	132	6	231	2	2	206	1	1 155	2
1967	13 357	675 708	5. 1	1 648	716	336	17	351	2	15	211	3	1 642	3
1968	13 574	988 165	7. 3	3 554	2 128	407	3	380	15	8	613	4	3 535	15
1969	13 817	1 026 330	7. 4	5 383	1 511	281	1	374	5	11	3 200	3	5 367	13
1970	11 226	567 249	5. 0	3 723	966	207	1	316	7	4	2 222	8	3 709	6
1971	11 260	641 021	5. 7	1 811	915	290	-	378	12	2	214	1	1 805	5
1972	11 866	500 179	4. 2	679	330	117	1	183	8	4	36	2	671	6
1973	12 037	464 394	3. 6	773	360	62	-	210	22	5	114	-	756	17
1974	13 347	431 325	3. 2	858	385	61	1	252	7	-	152	-	853	5

a) Includes mixed infections. b) Including 58 269 slides with 188 positives from non-malarious areas adjoining areas under attack phase.
b) January-September.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

NICARAGUA



	Population (thousands)	Area km^2
TOTAL COUNTRY	2 180	127 358
Non malarious areas	-	9 000
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	2 180	118 358
Total originally malarious areas	2 180	118 358

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	308	309
Evaluation operations	4	161	165
Administrative and other	-	129	129
Transport	-	68	68
Total	5	666	671

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	45	16	22	83
Two-wheel vehicles	-	6	-	6
Boats	25	6	8	39
Animals	-	-	-	-
Other	-	-	-	-
Total	70	28	30	128

NICARAGUA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Malathion							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Malathion	
1st	Nov.58-Dec. 59	1st 2nd	223 220 218 312	205 930 218 645	-	-	-	1 244 452 1 202 244	1 148 052 1 204 139	401 325	-	9.2 10.3
2nd	Jan. 60-Dec. 60	3rd 4th	226 831 237 553	230 478 239 076	-	-	-	1 232 373 1 275 185	1 252 160 1 283 375	376 396	-	9.4 8.9
3rd	Jan. 61-Dec. 61	5th 6th	237 062 248 739	239 375 249 068	-	-	- 2 469	1 244 338 1 276 530	1 256 399 1 290 900	403 396	- 410	9.5 9.2
4th	Jan. 62-Dec. 62	7th 8th	259 760 163 746	259 743 164 623	(a)	... 5 372	5 079 5 710	1 289 708 821 913	1 314 866 827 823	409 440	309 399	9.6 9.3
5th	Jan. 63-Dec. 63	9th 10th	170 580 55 574	115 023 59 876	(a)	5 958 9 320	11 460 11 356	863 624 279 693	618 699 306 925	465 471	420 439	9.0 9.0
6th	Jan. 64-Dec. 64	11th 12th	65 151 34 068	55 884 37 139	(a)	9 445 11 375	12 098 16 925	337 690 187 480	307 741 223 046	491 493	473 409	8.3 7.7
7th	Jan. 65-Dec. 65	13th 14th	32 752 33 124	33 998 30 010	(a)	14 817 11 343	12 653 14 953	206 178 189 793	202 201 191 910	476 436	429 425	7.9 8.5
8th	Jan. 66-Dec. 66	15th 16th	39 458 35 808	38 452 36 793	(a)	18 844 18 844	18 239 16 447	275 698 261 914	268 086 255 149	423 420	362 380	8.3 8.3
9th	Jan. 67-Dec. 67	17th 18th	59 766 67 305	56 652 86 055	(a)	19 203 19 203	17 634 17 081	379 051 415 238	376 386 518 110	414 410	374 375	8.4 8.3
10th	Jan. 68-Dec. 68	19th 20th	167 410 178 831	166 684 171 831	(a)	19 702 20 756	16 168 19 735	787 899 862 107	932 662 964 796	429 403	384 282	8.2 8.8
11th	Jan. 69-Dec. 69	21st 22nd	183 385 165 444	165 772 154 829	(a)	17 378 1 429	12 173 1 429	876 178 779 082	847 580 796 541	416 478	391 259	8.3 7.1
12th	Jan. 70-Dec. 70	23rd 24th	161 390 166 326	152 595 153 410	(b) (c)	25 619 71 215	19 204 64 854	757 382 765 520	764 946 692 950	416 404	452 185[c]	8.2 8.4
13th	Jan. 71-Dec. 71	25th 26th	17 083 17 217	15 084 15 508	(d) (e)	21 849[d] 282 345[e]	19 603[d] 260 383[e]	767 579 776 615	781 623 777 480	394 373	215[d] 187[e]	7.6 8.3
14th	Jan. 72-Dec. 72	27th 28th	13 843 11 803	10 854 8 722	(e)	388 485[e]	356 480[e]	930 917[f] 932 500[f]	931 134[f] 894 151[f]	322 329	196[e]	9.5 9.0
15th	Jan. 73-Dec. 73	29th 30th	12 576 10 703	8 329 8 300	(e)	366 278[e]	331 993[e]	693 913[f] 989 856[f]	690 720 969 178	352 368	191[e]	9.2 9.2
16th	Jan. 74-Dec. 74	31st 32nd	21 214 22 117	19 404 19 939	(e)	457 712[e]	424 048[e]	1 030 684 1 106 787	1 039 957 1 122 055	354 364	291[e]	8.7 8.1

a) The date cycles of malathion are in agreement with the cycles of DDT, although the malathion cycles are of four months. b) Two cycles with malathion. c) Summary of 3 quarterly spraying cycles with propoxur, beginning 6 April. d) Summary of 4 cycles with propoxur. f) Inhabitants protected with DDT and propoxur.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

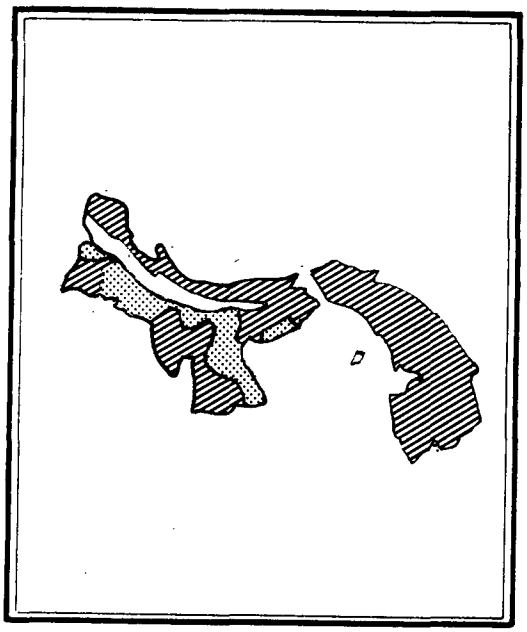
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958	23 982	890	3.7	...	...	...
1959	38 966	1 875	4.8	619	1 256	-
1960	74 074	7 528	10.2	4 217	3 311	-
1961	109 293	8 722	8.0	3 001	5 721	-
1962	162 733	11 200	6.9	3 428	7 772	-
1963	152 339	10 593	6.9	2 742	7 851	-
1964	173 068	11 197	6.5	2 403	8 794	-
1965	167 589	8 670	5.2	883	7 787	-
1966	197 472	13 895	7.0	2 045	11 850	-
1967	269 575	16 321	6.1	2 353	13 968	-
1968	411 544	8 250	2.0	479	7 771	-
1969	498 119	16 043	3.2	2 673	13 370	-
1970	281 386	27 260	9.7	5 180	22 080	-
1971	223 098	25 303	11.3	3 041	22 262	-
1972	208 232	9 595	4.6	666	8 929	-
1973	191 361	4 246	2.2	251	3 989	-
1974	233 941	12 167	5.2	1 452	10 715	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1962[a]	515	18 994[a]	7.4	159	57	13	-	50	-	1	38	26	132	1
1963	668	62 511	9.4	966	494	39	-	230	1	3	199	478	488	-
1964	695	74 543	10.7	1 819	654	140	-	364	1	1	659	506	1 313	-
1965	730	68 945	9.4	1 605	568	221	-	458	-	6	352	154	1 451	-
1966[b]	665	57 036	8.6	1 752	604	90	-	143	-	-	915	83	1 669	-

a) July-December. b) In 1967, consolidation areas reclassified to attack phase.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



PANAMA

	Population (thousands)	Area km^2
TOTAL COUNTRY	1 618	75 650
Non malarious areas	60	5 810
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	418	16 231
Attack phase	1 140	53 609
Total originally malarious areas	1 558	69 840

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	300	300
Evaluation operations	2	211	213
Administrative and other	-	63	63
Transport	-	19	19
Total	2	593	595

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	57	19	12	88
Two-wheel vehicles	-	57	-	57
Boats	19	20	4	43
Animals	-	-	-	-
Other	51	34	-	85
Total	127	130	16	273

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	Aug. 57-Aug. 58	-	-	-	1st	152 957	155 963	659 856 a)	671 824 a)	-	119	6.5
2nd	Sep. 58-Aug. 59	-	-	-	2nd	161 700	154 638	697 574	667 095	-	145	6.9
3rd	Sep. 59-Aug. 60	-	-	-	3rd	165 102	131 270	707 462	562 514	-	129	7.3
4th	Sep. 60-Apr. 62	-	-	-	4th	172 121	199 265	722 392	836 229	-	138	6.8
5th	May 62-Apr. 63	1st 2nd	175 622 182 784	174 779 184 355	-	(b)	1 101 c) 1 192 c)	710 918 714 320	711 983 726 944	490 510	63 103	8.1 8.8
6th	May 63-Apr. 64	3rd 4th	197 379 205 165	193 960 176 912	-	(b)	1 024 c) 1 268 c)	733 060 771 827	724 166 670 310	477 455	77 71	8.9 9.3
7th	May 64-Jun. 65	5th 6th	209 126 206 495	201 976 183 650	-	(b) 1 332	1 078 c) 1 867 c)	750 420 724 990	728 633 647 164	440 421	77 77	9.0 9.0
8th	Jul. 65-Jun. 66	7th 8th	205 050 211 390	196 902 193 629	-	1 105 ...	1 133 c) 1 249	730 020 710 101	701 266 654 648	421 416	73 71	8.8 7.4
9th	Jul. 66-Jun. 67	9th 10th	215 450 217 620	196 258 197 700	-	1 250 -	1 315 -	720 552 761 670	664 620 712 459	428 432	83 -	7.5 8.0
10th	Jul. 67-Jun. 68	11th 12th	201 950 205 148	194 832 168 479	-	-	-	706 825 759 048	649 039 584 220	431 436	-	8.3 7.5
11th	Jul. 68-Jun. 69	13th 14th	207 214 208 154	165 285 183 546	-	-	-	766 692 749 354	563 486 644 757	423 434	-	7.0 7.6
12th	Jul. 69-Jun. 70	15th 16th	215 369 208 281	196 003 203 098	-	-	-	755 945 757 402	757 402 775 191	495 472	-	7.1 7.7
13th	Jul. 70-Jun. 71	17th 18th	189 385 201 656	187 414 197 882	1-2nd d) 3-6th d)	- 54 300	39 316 d) 55 278 d)	698 842 853 503	688 722 825 776	479 471	-	7.3 7.5
14th	Jul. 71-Jun. 72	19th 20th	177 683 132 985	174 339 125 341	7-10th d)	47 164	42 622 d)	750 777 484 451	736 826 438 096	464 461	-	7.5 7.2
15th	Jul. 72-Jun. 73	21st 22nd	131 447 91 164	126 008 77 482	11-14th d) 5-8th f)	26 564 13 304 f)	24 802 d) 12 462 f)	463 653 318 170	424 765 262 202	458 467	- -	7.7 7.0
16th	Jul. 73-Jun. 74	23rd 24th	103 356 e) 86 191 e)	92 157 e) 80 837 e)	9-12th	23 303	22 047 f)	363 131 277 882 e)	334 446 e) 280 248 c)	478 486	- -	6.3 6.3
17th	Jul. 74-Dec. 74	25th	82 133	78 026 e)				266 779	247 131 e)	494	-	6.5

a) Estimated b) Included in DDT column. c) Sprayed twice a year with 0.3 g/m^2. d) Quarterly cycles with DDT. e) Includes houses sprayed and inhabitants protected in annual cycles. f) Four quarterly cycles with Propoxur.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

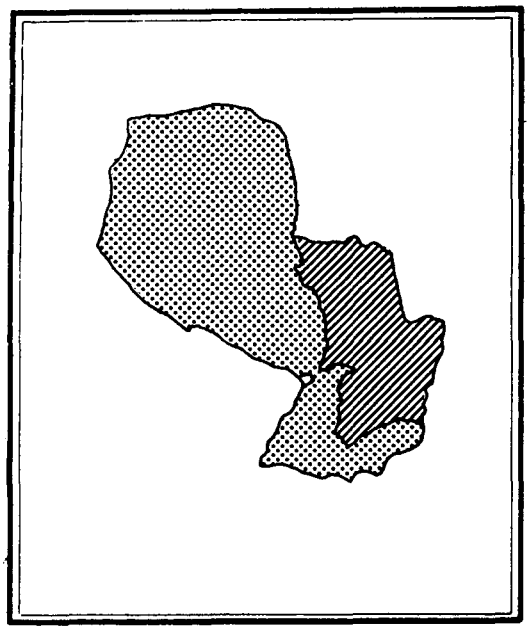
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
1957b)	18 181	1 162	6.4	545	...	...
1958	91 933	6 067	6.6	1 461	4 537	69
1959	78 661	5 017	6.4	620	4 395	2
1960	77 099	4 463	5.8	670	3 792	1
1961	88 961	3 911	4.4	1 378	2 531	2
1962	145 012	3 249	2.2	631	2 618	-
1963	152 898	2 670	1.7	236	2 433	1
1964	131 887	1 804	1.4	101	1 703	-
1965	102 969	1 929	1.9	172	1 757	-
1966	97 525	3 664	3.8	919	2 744	1
1967	88 614	2 697	3.0	527	2 170	-
1968	83 211	1 625	2.0	495	1 130	-
1969	94 596	5 938	6.3	4 106	1 832	-
1970	237 477	4 584	1.9	3 402	1 182	-
1971	301 930	1 041	0.3	572	468	1
1972	269 097	819	0.3	543	276	-
1973	344 315	1 595	0.5	615	944	-
1974	288 831	1 181	0.4	481	700	-

a) Includes mixed infections. b) August-December.

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1974	418	79 989	19.1	3	1	-	1	1	-	-	-	-	3	-

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



	PARAGUAY Population (thousands)	Area km^2
TOTAL COUNTRY	2 494	406 752
Non malarious areas	416	200
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 174	301 189
Attack phase	904	105 363
Total originally malarious areas	2 078	406 552

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	150	151
Evaluation operations	5	204	209
Administrative and other	4	101	105
Transport	-	50	50
Total	10	505	515

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	41	6	11	58
Two-wheel vehicles	-	225	10	235
Boats	7	14	-	21
Animals	-	-	-	-
Other	14	27	-	41
Total	62	272	21	355

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	Nov. 57-Oct. 58	-	-	-	1st	126 902	148 626	638 190	747 541	-	105	10. 9
2nd	Nov. 58-Oct. 59	-	-	-	2nd	150 033	161 261	749 115	805 232	-	111	14. 3
3rd	Nov. 59-Oct. 60	-	-	-	3rd	163 586	171 086	807 460	844 515	-	118	11. 7
4th[a]	Nov. 60-Mar. 61	-	-	-	4th[a]	181 097	56 656	898 060	280 982	-	138	8. 1
(b)	Jan. 65-May. 65	-	-	-	-	-	5 709	-	27 213	-	129	6. 6
(b)	Jan. 66-Dec. 66	-	-	-	-	-	6 993	-	55 614	-	126	6. 9
(b)	Jan. 67-Dec. 67	-	-	12 359	-	-	1 519	...	70 227	534	134	6. 7
1st[c]	Oct. 68-Sep. 69	1st	330 000	304 100	-	-	-	1 500 000	1 384 606	472	-	8. 2
		2nd	314 102	311 000				1 430 000	1 461 027	448		9. 1
2nd	Oct. 69-Sep. 70	3rd	317 805	313 917	-	-	-	1 397 988	1 378 239	477	-	9. 3
		4th	317 142	303 370				1 370 225	1 285 511	523		8. 5
3th	Oct. 70-Sep. 71	5th	308 357	300 154[d]	-	-	-	1 286 295	1 298 275	535	-	8. 7
		6th	256 189	255 789[d]				1 053 446	1 065 384	538		8. 5
4th	Oct. 71-Sep. 72	7th	227 811	228 570	-	-	-	962 015	943 668	536	-	8. 7
		8th	191 980	187 529	-	-	-	785 294	753 124	522	-	8. 7
5th	Oct. 72-Apr. 73	9th	145 124	148 398	1st-4th[e]	4 800[e]	4 249[e]	599 759	596 023	499	-	8. 6
6th	May 73-Nov. 73	10th	75 522	79 703	1st-3rd[f]	3 912[f]	3 674[f]	306 434	320 823	473	-	8. 8
7th	Nov. 74-Jun. 74	11th	78 035	76 711	1st-3rd	4 849[f]	4 918[f]	337 024	301 415	443	-	9.0
	Jul. 74-Nov. 74	12th	78 418	75 228				283 193	290 039	441		9.4

a) Program suspended, new program being planned. b) Emergency spraying. c) New coverage started in October 1968. d) In addition 4 108 complementary sprayings were applied. e) Quarterly cycles with DDT. f) Three 4-months cycles with DDT.

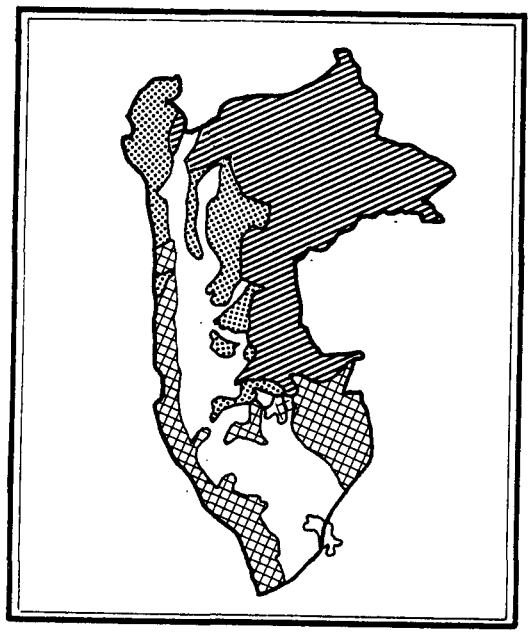
EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum[a]	P. vivax	P. malariae
		Number	Percentage			
1958	14 359	526	3.7	...	...	...
1959	11 379	641	5.6	1	640	-
1960	47 045	1 165	2.5	5	1 159	1
1961	27 995	1 528	5.5	9	1 519	-
1962	48 184	5 756	11.9	313	5 443	-
1963	92 806	3 443	3.7	313	3 130	-
1964	103 169	8 851	8.6	961	7 889	1
1965	82 848	6 732	8.1	115	6 616	1
1966	131 293	33 026	25.1	717	32 309	-
1967	164 444	50 304	30.6	6 636	43 668	-
1968	113 770	20 743	18.2	794	19 949	-
1969	129 509	10 307	8.0	1 591	8 716	-
1970	157 587	1 429	0.9	155	1 274	-
1971	169 488	423	0.2	194	229	-
1972	185 659	94	0.1	11	83	-
1973	85 868	41	0.05	2	39	-
1974	70 379	100	0.1	6	94	-

AREAS EN FASE DE CONSOLIDACION

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1973	1 158	60 011	5.2	0	-	-	-	-	-	-	-	-	-	-
1974	1 174	54 424	4.6	1	-	-	-	-	-	-	1	-	1	-

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



PERU

	Population (thousands)	Area km^2
TOTAL COUNTRY	15 351	1 285 215
Non malarious areas	10 000	324 044
Originally malarious areas		
Maintenance phase	1 465	195 818
Consolidation phase	2 581	221 930
Attack phase	1 305	543 423
Total originally malarious areas	5 351	961 171

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	3	359	362
Evaluation operations	16	286	302
Administrative and other	-	123	123
Transport	-	60	60
Total	19	828	847

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	9	49	53	111
Two-wheel vehicles	-	5	-	5
Boats	35	50	28	113
Animals	-	-	-	-
Other	-	-	-	-
Total	44	104	81	229

PERU (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	Nov. 57-Oct. 58	1st + 2nd	527 081	286 764a) 79 266b)	1st	(c)	122 120	2 054 035	1 867 208	426	115	7.8
2nd	Jan. 59-Dec. 59	(d)	637 241	271 065e)	2nd	(c)	341 804	2 886 064	2 775 694	424	118	8.4
3rd	Jan. 60-Dec. 60	(d)	654 825	447 848e)	3rd	(c)	234 643	3 209 952	3 345 726	468	95	8.4
4th	Jan. 61-Dec. 61	(d)	714 740	534 037e)	4th	(c)	25 005	2 826 797	2 210 988	410	109	7.9
5th	Jan. 62-Dec. 62	(d)	646 992	627 527e)	-	-	-	2 354 405	2 283 960	465	-	8.7
6th	Jan. 63-Dec. 63	(d)	537 112	500 218e)	-	-	-	1 885 800	1 756 286	459	-	8.1
7th	Jan. 64-Dec. 64	(d)	357 805	379 184e)	-	-	-	1 182 617	1 253 290	473	-	7.9
8th	Jan. 65-Dec. 65	(d)	264 319	240 003e)	-	-	-	860 017	780 901	507	-	7.2
9th	Jan. 66-Dec. 66	(d)	190 613	186 109e)	-	-	-	610 379	595 958	523	-	6.6
10th	Jan. 67-Dec. 67	(d)	169 436	162 433e)	-	-	-	559 139	545 895	517	-	6.7
11th	Jan. 68-Dec. 68	(d)	150 780	153 893e)	-	-	-	507 634	546 434	584	-	5.9
12th	Jan. 69-Dec. 69	(d)	167 469	173 975	-	-	-	611 117	601 630	506	-	6.3
13th	Jan. 70-Dec. 70	(d)	185 837	188 723f)	-	-	-	643 223	681 203	521	-	6.2
14th	Jan. 71-Dec. 71	(d)	229 327	218 566	-	-	-	780 994	757 451	510	-	6.8
15th	Jan.72-Dec.72	(d)	229 504	229 605	1st-3rdg)	36 063g)	36 936g)	816 587	808 967	508	-	7.1
16th	Jan.73-Dec.73	(d)	381 946	285 606	-	-	3 199h)	1 361 184	1 044 975	517	-	7.4
17th	Jan.74-Dec.74	(d)	391 377	383 405	-	-	11 700h)	1 961 350	1 401 513	528	-	7.4

a) Sprayed once a year. b) Sprayed twice a year. c) Included in DDT column. d) Owing to different spray cycle in timing in different regions, these data refer to calendar year. e) Sprayings. f) Includes houses sprayed in quarterly cycles. g) Three cycles sprayed with DDT. h) Emergency spraying.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958 a)	...	649 b)	...	77	526	27
1959	148 413	4 658 b)	3.1	302	4 265	51
1960	342 503	3 901	1.1	256	3 559	86
1961	403 748	3 055	0.8	185	2 804	66
1962	399 309	2 195	0.5	81	2 034	80
1963	309 519	1 678 b)	0.5	98	1 426	140
1964	308 283	1 613	0.5	301	1 222	90
1965	280 449	1 508	0.5	113	1 315	80
1966	247 298	1 934	0.7	32	1 802	100
1967	198 340	2 689	1.4	105	2 512	72
1968	129 951	1 970	1.5	51	1 875	44
1969	145 495	2 849	2.0	22	2 789	38
1970	164 262	4 008	2.4	134	3 800	74
1971	164 595	2 351	1.4	12	2 315	24
1972	144 680	3 734	2.6	3	3 704	27
1973	138 309	6 911	5.0	1	6 886	24
1974	117 675	10 193	7.7	-	10 193	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1959	14	1 378	9.8	-	-	-	-	-	-	-	-	-	-	-
1960	15	7 277	48.5	5	-	-	1	-	4	-	-	-	1	4
1961	47	13 780	29.3	1	-	-	-	1	-	-	-	-	1	-
1962	864	71 330	8.3	21	2	1	1	12	4	-	1	1	18	2
1963	2 199	172 468	7.8	65	13	6	5	38	3	-	-	-	58	7
1964	2 204	186 205	8.4	321	209	45	-	25	2	3	37	1	316	4
1965	2 334	165 388	7.1	367	209	50	1	6	1	-	100	13	349	5
1966	1 962	157 663	8.0	108	14	4	1	5	1	-	83	-	108	-
1967	1 992	112 859	5.7	80	65	5	1	2	-	4	3	-	78	2
1968	2 184	85 336	3.9	34	10	6	1	9	1	-	7	1	31	2
1969	2 256	94 652	4.2	310	191	10	3	72	-	-	34	-	309	1
1970	2 283	112 359	4.9	253	160	11	-	55	1	3	23	-	252	1
1971	2 354	138 043	5.8	1 650	912	32	-	9	-	-	697	-	1 650	-
1972	2 427	140 696	5.8	5 507	1 939	50	-	14	-	-	3 504	-	5 506	1
1973	2 503	144 338	5.8	5 080	1 445	3	1	53	-	-	3 578	-	5 080	-
1974	2 581	132 614	5.1	2 109	637	-	-	114	2	-	1 356	-	2 109	-

a) November 1957-October 1958. b) Includes undifferentiated mixed infections.

MAINTENANCE PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1963	43	8 581	20.0	4	-	-	1	1	2	-	-	-	2	2
1964	43	8 256	19.2	-	-	-	-	-	-	-	-	-	-	-
1965	46	6 260	13.6	2	-	-	-	-	2	-	-	-	-	2
1966	1 044	20 032	1.9	7	-	-	1	3	1	-	2	-	5	2
1967	1 058	30 738	2.9	3	-	-	-	2	1	-	-	-	1	2
1968	1 112	31 829	2.9	6	-	-	-	1	2	-	3	-	5	1
1969	1 133	25 645	2.3	9	2	-	4	-	1	-	2	-	7	2
1970	1 299	33 681	2.6	234	160	-	-	2	-	-	72	1	230	3
1971	1 339	52 127	3.9	127	64	1	1	1	-	-	60	-	127	-
1972	1 380	55 708	4.0	29	3	1	1	16	2	3	3	2	26	1
1973	1 421	56 919	4.0	42	14	-	-	25a)	-	1	2	-	41	1
1974	1 465	62 280	4.3	168	111	2	4	19[a)]	-	-	32	-	168	-

a) Includes cases imported from consolidation phase areas.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

VENEZUELA

	Population (thousands)	Area km^2
TOTAL COUNTRY	11 518	912 050
Non malarious areas	2 878	312 050
Originally malarious areas		
Maintenance phase	8 123	460 054[b]
Consolidation phase	-	-
Attack phase	517	139 946
Total originally malarious areas	8 640	600 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	4	449	453
Evaluation operations	15	494	509
Administrative and other[a]	-	-	-
Transport[a]	-	-	-
Total	19	943	962

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	157	-	-	157
Two-wheel vehicles	42	-	-	42
Boats	45	-	-	45
Animals	365	-	-	365
Other	86	-	-	86
Total	695	-	-	695

a) Services performed by personnel of the "Dirección de Malariología y Saneamiento Ambiental" in charge of different programs of Environmental Sanitation.

VENEZUELA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
...	Jan. 62-Dec. 62	...	595 757	510 287[a]	...	(b)	29 782	2 305 330	2 024 180	365	218	6.6
...	Jan. 63-Dec. 63	...	526 626	475 753[a]	...	(b)	4 112	2 155 390	1 964 197	368	274	7.0
...	Jan. 64-Dec. 64	...	505 250	490 884[a][c]	...	(b)	(b)	2 069 353[d]	2 010 565	384	...	7.3
...	Jan. 65-Dec. 65	...	553 218[d]	522 616[a][c]	-	-	-	2 279 763[d]	2 153 429	422	-	7.0
...	Jan. 66-Dec. 66	...	676 336	611 665[a][c]	-	-	-	2 825 556	2 554 844	399	-	6.7
...	Jan. 67-Dec. 67	...	675 556	623 926[a]	-	-	-	2 837 335	2 578 451	373	-	7.2
...	Jan. 68-Dec. 68	...	543 874	505 452[a]	-	-	-	...	2 039 352	465	-	6.3
...	Jan. 69-Dec. 69	...	477 090	492 476[a]	-	-	-	1 744 475	1 996 617	479	-	6.8
...	Jan. 70-Dec. 70	...	451 291	397 766[a]	-	-	-	1 789 893	1 610 726	884	-	5.8
...	Jan. 71-Dec. 71	...	374 836	343 936[a]	-	-	-	1 506 408	1 375 523	916	-	6.2
...	Jan. 72-Dec. 72	...	443 341	403 867[a]	-	-	-	1 683 585	1 639 210	773	-	5.8
...	Jan. 73-Dec. 73	...	395 916	390 822[a]	-	-	-	1 563 772	1 570 930	744	-	5.8
...	Jan. 74-Dec. 74	...	431 012	407 293	-	-	-	1 621 526	1 587 021	744	-	5.8

a) Including houses sprayed twice, three and four times a year. b) Included in DDT column. c) Including houses sprayed with BHC or lindane.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958	269 448	975[a]	0.4	60	901	4
1959	232 710	765[a]	0.3	92	646	14
1960	247 429	1 346[a]	0.5	165	1 163	6
1961	230 336	1 175[a]	0.5	68	1 075	21
1962	172 280	883[b]	0.5	53	812	14
1963	153 406	2 194[b]	1.4	80	2 083	20
1964	141 977	3 948[b]	2.8	451	3 486	4
1965	171 864	2 739[a]	1.6	137	2 597	2
1966	194 637	3 510[a]	1.8	449	3 011	39
1967	249 057	4 281[a]	1.7	933	3 323	18
1968[c]	198 732	5 401[a]	2.7	1 486	3 838	54
1969	154 827	7 713[a]	5.0	1 836	5 715	68
1970	88 391	11 915[a]	13.5	1 524	10 320	17
1971	108 743	17 842[a]	16.4	2 938	14 846	3
1972	112 612	13 537	12.0	4 747	8 786	4
1973	106 245	8 591[a]	8.1	2 289	6 298	4
1974	97 801	5 774[a]	5.9	1 115	4 616	4

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1958	469	69 614	14.8	50	-	-	27		-	23	-	2	46	2
1959	685	101 878	14.9	45	-	-	37		1	7	-	2	43	-
1960	291	93 047	32.0	112[a]	-	2	31	45	1	33	-	-	108	2
1961	174	64 923	37.3	57	-	4	15	9	-	29	-	-	57	-
1962	150	93 646	62.4	74[a]	-	1	29	7	-	37	-	22	51	-
1963	102	61 724	60.5	89[a]	-	-	32	7	-	50	-	26	62	-
1964	99	58 605	59.2	74	-	-	15	9	-	50	-	-	74	-
1965	132	57 709	43.7	34[a]	-	1	15	6	-	12	-	15	18	-
1966	67	40 752	60.8	46	-	-	19	10	-	17	-	8	38	-
1967	37	27 772	75.1	34	-	-	16	2	-	16	-	3	31	-

a) Includes undifferentiated mixed infections. b) Includes undifferentiated mixed infections and unclassified species of parasites.
c) In 1968 areas in consolidation were reclassified to attack phase.

VENEZUELA (Cont.)

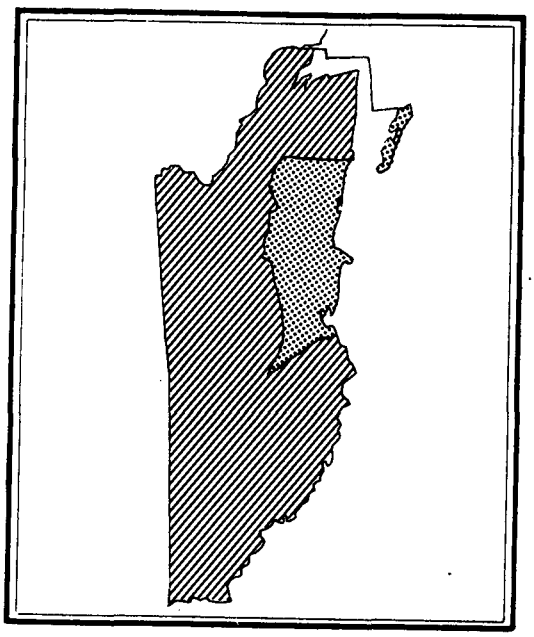
MAINTENANCE AND NON-MALARIOUS AREAS [a]

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1958	4 720	145 654	3.1	113[b]	-	-	79		5	28	1	6	100	6
1959	5 097	169 189	3.3	101[b]	-	-	87		6	7	1	14	73	9
1960	6 092	224 193	3.7	216[b]	-	6	44	92	4	70	-	14	197	4
1961	7 111	305 252	4.3	522[b]	-	11	52	122	4	333	-	13	498	5
1962	7 410	282 314	3.8	253[b]	-	5	52	84	2	110	-	5	244	3
1963	7 701	284 814	3.7	570	-	-	79	286	3	202	-	6	562	2
1964	7 973	317 731	4.0	1 862[b]	-	1	195	1 326	1	339	-	12	1 846	3
1965	8 205	315 462	3.8	2 591[b]	-	-	100	1 079	5	1 407	-	61	2 485	25
1966	8 506	432 151	5.1	1 925[b]	-	1	145	1 024	6	748	1	47	1 867	8
1967	8 772	373 853	4.3	942	-	1	79	611	3	248	-	75	861	4
1968	8 919	328 721	3.7	334	1	-	44	253	3	32	1	22	306	6
1969	9 151	313 331	3.4	1 027[b]	94	12	165	654	3	98	1	86	937	3
1970	9 382	183 058	2.0	3 373[b]	545	13	289	2 234	3	289	-	211	3 145	3
1971 [a]	7 017	159 184	2.3	5 664	220	3	76	4 407	3	955	-	584	5 014	1
1972	7 701	150 343	2.0	4 525	391	4	84	3 520	3	523	-	1 700	2 822	3
1973	7 912	139 571	1.8	2 964	339	7	89	1 125	5	1 397	2	792	2 172	-
1974	8 123	142 669	1.8	1 810[b]	665	3	53	572	1	516	-	901	890	1

a) Started 1971 the information refers only to maintenance phase. b) Includes undifferentiated mixed infections.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974

BELIZE



	Population (thousands)	Area km^2
TOTAL COUNTRY	135	22 965
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	79	8 811
Attack phase	56	14 154
Total originally malarious areas	135	22 965

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	15	15
Evaluation operations	1	12 (1)	13 (1)
Administrative and other	1	4	5
Transport	-	2	2
Total	2	33 (1)	35 (1)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	4	8	-	12
Two-wheel vehicles	-	-	-	-
Boats	-	-	6	6
Animals	-	-	-	-
Other	-	-	-	-
Total	4	8	6	18

BELIZE (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Cycle DDT	Houses sprayed		Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
			Planned	Sprayed	Planned	Protected		
(a)	Jun. 66-Dec. 66	...	...	6 447	...	30 889	426	10.0
...	Jan. 67-Dec. 67	1st -2nd	...	15 820	...	48 213	399	7.6
...	Jan. 68-Dec. 68	3rd 4th	10 720 10 720	10 297 5 375	70 450 70 450	45 167 24 802	463 489	7.5 6.8
...	Jan. 69-Jan. 70	5th 6th	10 127 11 127	9 060 10 882	72 316 72 316	41 541 48 476	508 499	7.1 7.7
...	Feb. 70-Dec. 70	7th 8th	11 127 11 735	11 443 7 772	72 316 70 030	50 000 34 433	421 475	8.5 8.2
...	Jan. 71-Dec. 71	9th 10th	11 735 11 735	11 132 9 000	72 519 72 519	46 284 39 420	622 619	9.1 9.7
...	Jan. 72-Dec. 72	11th 12th	12 274 12 070	12 060 10 238	72 520 74 914	52 486 43 810	617 602	9.1 9.2
...	Jan. 73-Dec. 73	13th 14th	12 364 12 701	11 761 11 319	58 614 58 614	50 695 48 359	607 531	9.5 9.1
...	Jan. 74-Nov. 74	15th 16th	10 858 11 121	8 400 7 490	44 267 47 278	34 718 33 452	512 566	9.1 8.1

a) New coverage started.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

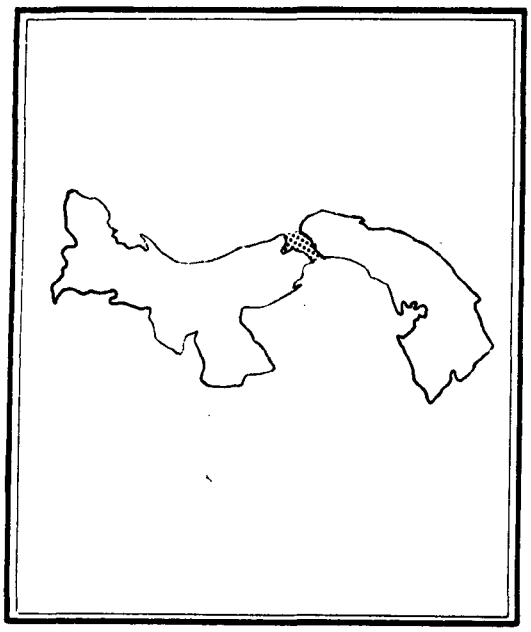
Year	Slides examined			Species found		
	Total No.	Positive				
		Number	Percentage	P. falciparum	P. vivax	P. malariae
1957	1 950	234	12.0	137	52	45
1958	4 374	288	6.6	117	147	24
1959	11 307	1 019	9.0	712	211	96
1960	13 307	196	1.5	55	138	3
1961	12 355	23	0.2	1	22	-
1962	7 895	2	0.03	-	2	-
1967[a]	12 959	358	2.8	160	198	-
1968	10 690	39	0.4	1	38	-
1969	10 725	27	0.3	-	27	-
1970	12 697	28	0.2	-	28	-
1971	12 531	31	0.2	1[b]	30	-
1972	16 561	84	0.5	-	84	-
1973	22 082	98	0.4	-	98	-
1974	14 620	67	0.5	-	67	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1962[c]	100	6 661[c]	16.0	18	10	7	1	-	-	-	-	-	18	-
1963	100	13 085	13.1	17	17	-	-	-	-	-	-	-	17	-
1964	104	11 826	11.4	35	32	2	1	-	-	-	-	-	35	-
1965	105	10 787	10.3	206	200	-	4	-	-	-	2	188	18	-
1966	107	13 920	13.0	552	551	-	1	-	-	-	-	260	292	-
1967	46	1 814	3.9	17	8	-	2	6	-	-	1[d]	10	7	-
1968	48	1 581	3.3	-	-	-	-	-	-	-	-	-	-	-
1969	49	1 469	3.0	1	-	-	-	1	-	-	-	-	1	-
1970	50	2 825	5.7	5	3	1	-	-	-	-	1[d]	-	5	-
1971	51	3 172	6.2	2	1	-	-	-	-	-	1	2	-	-
1972	53	3 244	6.1	2	-	-	-	1	-	-	1	2	-	-
1973	55	2 332	4.2	1	-	-	-	-	-	-	1[d]	-	1	-
1974	79	8 480	10.7	29	21	-	3	2	-	2	1	-	29	-

a) At the beginning of 1967 all areas were brought back to attack phase, with the exception of Belize District. b) Mixed infection.
c) August-December. d) Cryptic case.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



CANAL ZONE

	Population (thousands)	Area km^2
TOTAL COUNTRY	48	1 432
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	48	1 432
Attack phase	-	-
Total originally malarious areas	48	1 432

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	(13)	(13)
Evaluation operations	(17)	-	(17)
Administrative and other	-	-	-
Transport	(4)	-	(4)
Total	(21)	(13)	(34)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	(2)	(2)
Two-wheel vehicles	-	-	-	-
Boats	-	-	(2)	(2)
Animals	-	-	-	-
Other	-	-	-	-
Total	-	-	(4)	(4)

(Figures in parenthesis indicate part-time)

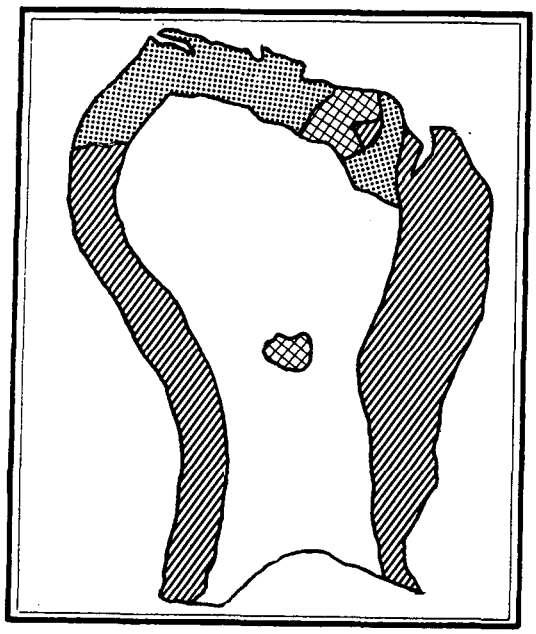
CANAL ZONE (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1960	41	2 656	6.5	27	27	-	-	-	-	-	-	3	24	-
1961	41	5 984	14.6	25	25	-	-	-	-	-	-	2	23	-
1962	44	677	1.5	18	18	-	-	-	-	-	-	-	18	-
1963	47	21 008	44.7	22	-	1	16	-	-	-	5	2	20	-
1964	50	26 228	52.5	21	7	3	1	10	-	-	-	-	21	-
1965	50	24 024	48.0	38	1	7	29	-	-	1	-	6	32	-
1966[a]	50	23 434[a]	51.1	71	26	4	41	-	-	-	-	1	70	-
1967	50	29 762	60.0	111	87	8	16	-	-	-	-	7	104	-
1968	50	22 367	44.7	89	70	8	10	-	-	-	1	5	84	-
1969	50	31 876	63.8	158	45	12	101	-	-	-	-	43	115	-
1970	51	35 462	69.5	57	16	2	39	-	-	-	-	35	22	-
1971	60	35 734	59.6	39	12	3	24	-	-	-	-	18	21	-
1972	50	38 896	77.8	41	6	7	28	-	-	-	-	32	9	-
1973	48	30 997	64.6	11	2	1	8	-	-	-	-	9	2	-
1974	48	29 082	60.6	2	-	-	2	-	-	-	-	1	1	-

a) January-November.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



FRENCH GUIANA

	Population (thousands)	Area km^2
TOTAL COUNTRY	50	90 000
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	25	200
Consolidation phase	19	82 300
Attack phase	6	7 500
Total originally malarious areas	50	90 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	68	68
Evaluation operations	2	15	17
Administrative and other	-	6	6
Transport	-	26	26
Total	2	115	117

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	11	-	1	12
Two-wheel vehicles	-	-	-	-
Boats	12	-	-	12
Animals	-	-	-	-
Other	-	-	-	-
Total	23	-	1	24

FRENCH GUIANA (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
...	Jan. 64-Dec. 64	...	2 137	1 972	...	8 912	2 326[a]	37 915	14 762	330	...	...
...	Jan. 65-Dec. 65	...	2 127	1 246	...	8 912	7 318[a]	...	...	253	...	...
...	Jan. 66-Dec. 66	...	2 117	2 500	...	8 912	6 932[a]	44 433	38 000	...	...	...
...	Feb. 67-Dec. 67	...	3 886	845	...	10 574	8 081[a]	...	...	...	...	...
...	Feb. 68-Dec. 68	...	3 000	2 977	...	11 000	10 487[b]	46 400	...	...	...	...
...	Feb. 69-Dec. 69	...	(c)	(c)	...	28 105[c]	26 861[c]	43 500	43 500	...	...	...
...	Feb. 70-Dec. 70	...	-	-	...	28 050	27 967[c]	45 000	45 000	...	...	...
...	Jan. 71-Dec. 71	...	-	1 996	-	-	-	-	-	-	-	-
...	Jan. 72-Dec. 72	...	15 899	12 361	-	-	-	50 000	-	-	-	-
...	Jan. 73-Dec. 73	...	15 800	14 650	-	-	-	43 400	...	-	-	-
...	Jan. 74-Dec. 74	...	4 000	3 160	-	-	-	6 500	...	-	-	-

a) Includes houses sprayed with DDT once a year, malathion and actidrine. b) Sprayed with malathion once a year. c) Includes houses sprayed with DDT, malathion and dieldrin.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

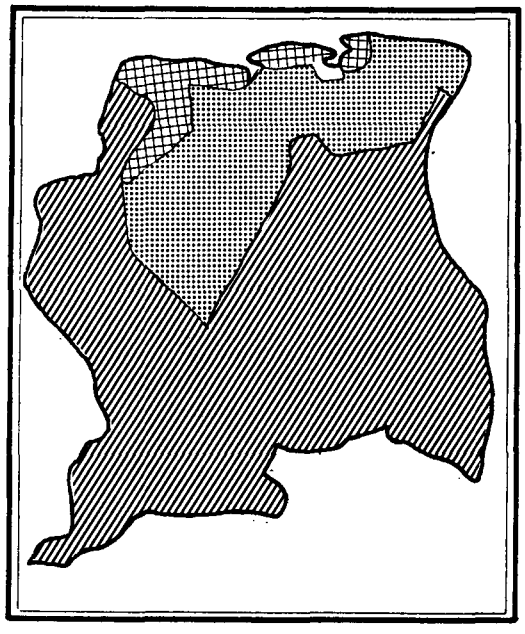
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1960	3 343	37	1.1	30	6	1
1961	1 197	33	2.8	33	-	-
1962	2 183	70	3.2	60	10	-
1963	2 648	70	2.6	61	9	-
1964	3 025	48	1.6	16	32	-
1965	5 424	22	0.4	15	7	-
1966	6 180	12	0.2	8	4	-
1967	9 811	25	0.3	19	6	-
1968	7 132	50	0.7	35	14	1
1969 a)	680	12	1.8	7	5	-
1970	1 057	45	4.3	41	4	-
1971	804	62	7.7	62	-	-
1972	1 774	23	1.3	21	2	-
1973	2 929	92	3.1	86	6	-
1974	4 254	54	1.3	48	6	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1969 a)	15	185	1.2	20	17	-	-	3	-	-	-	9	11	-
1970	15	137	1.0	19	8	-	11	-	-	-	-	10	9	-
1971	14	467	3.3	34	15	-	-	-	1	-	18	22	12	-
1972	19	915	4.8	69	50	-	-	-	-	-	19	63	6	-
1973	19	5 010	26.4	294	152	1	2	1	-	8	130	294	-	-
1974	19	2 130	11.2	83	72	-	3	3	-	2	3	83	-	-
MAINTENANCE PHASE AREAS														
1969 a)	25	6 135	24.5	20	13	2	-	5	-	-	-	4	16	-
1970	27	7 043	26.1	53	6	1	5	-	-	36	5	50	3	-
1971	33	5 905	18.0	20	6	2	1	-	-	-	11	16	4	-
1972	25	4 908	19.6	100	11	-	2	41	-	-	46 b)	94	6	-
1973	25	1 800	7.2	98	9	-	2	64 c)	-	7	16 b)	97	1	-
1974	25	2 769	11.1	214	171	-	2	25	-	1	15 b)	212	2	-

a) Before 1969, information not separated by phase of program. b) Includes cryptic cases. c) 47 cases imported from consolidation phase areas.

STATUS OF MALARIA PROGRAM AT DECEMBER 1974



SURINAM

	Population (thousands)	Area km^2
TOTAL COUNTRY	418	163 820
Non malarious areas	150	70
Originally malarious areas		
Maintenance phase	190	8 955
Consolidation phase	45	55 345
Attack phase	33	99 450
Total originally malarious areas	268	163 750

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	47	47
Evaluation operations	1	41	42
Administrative and other	-	13	13
Transport	-	58	58
Total	1	159	160

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	3	2	1	6
Two-wheel vehicles	-	4	1	5
Boats	-	-	-	-
Animals	-	-	-	-
Other	-	-	-	-
Total	3	6	2	11

SURINAM (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed						Inhabitants directly protected		Insecticide used per house (g. technical)		Average houses sprayed per spray-man/day
		DDT			Dieldrin							
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	Dieldrin	
1st	May 58-Apr. 59	1st 2nd	32 722 35 540	31 299 40 211	1st	(a)	2 554 4 930	147 314 150 334	152 422 190 951	310 318	58 60	5.8 6.9
2nd	May 59-Apr. 60	3rd 4th	39 683 50 024	37 563 37 445	2nd	(a)	8 342 4 713	149 287 187 640	172 694 158 143	274 250	58 57	8.0 7.8
3rd	May 60-Jun. 61	5th 6th	46 537 50 652	36 861 16 298	3rd	(a)	4 571 2 187	172 233 138 229	153 687 50 462	263 211	65 56	6.2 6.0
4th	Jul. 61-Jun. 62	7th 8th	18 485 22 351	15 533 12 984	-	-	1 320 -	47 746 57 732[b]	43 526 33 537[b]	211 -	54 -	5.7 ...
5th	Jul. 62-Jun. 63	9th 10th	... ...	6 397 16 681	-	-	-	... ...	16 523[b] 42 558	-	-	...
6th	Jul. 63-Jun. 64	11th 12th	... 12 824	8 458 5 603	- 1st	- (a)	- 6 605	... 29 300	19 164 27 893	- 175	- 61	... 6.5
7th	Jul. 64-Jun. 65	13th 14th	12 824 25 648	682 1 813	2nd 3rd	(a) (a)	4 708 10 969	28 693 52 873	12 060 26 350	217 191	62 66	6.3 7.8
8th	Jul. 65-Jun. 66	15th 16th	25 648 29 486	11 550 1 488	4th 5th	(a) (a)	(a) 10 394	58 279 55 319	25 260 22 292	... 164	... 84	... 6.4
9th	Jul. 66-Jun. 67	17th 18th	31 546 31 950	3 662 3 320	6th 7th	(a) (a)	8 975 11 754	73 953 ...	29 625 37 096	161 179	76 77	6.3 6.5
10th	Jul. 67-Jun. 68	19th 20th	32 542 22 406	1 774 2 277	8th 9th	(a) (a)	6 837 7 319	... 54 981	16 239 17 200	149 141	73 84	6.3 5.0
11th	Jul. 68-Jun. 69	21st 22nd	22 406 14 550	1 653 340	10th 11th	(a) (a)	4 033 3 595	54 981 36 250	9 719 3 314	169 181	77 65	5.1 5.3
12th	Jul. 69-Jun. 70	23rd 24th	14 550 15 400	399 250	12th 13th	(a) (a)	2 898 3 599	36 250 36 636	2 202 5 754	220 307	61 62	6.1 5.0
13th	Jul. 70-Dec. 70	25th	15 400	193	14th	(a)	2 477	36 636	4 831	328	84	4.4
14th	Jan. 71-Dec. 71	-	-	-	... ...	9 100 9 100	2 623 1 880	13 850 13 850	706 793	-	66 65	5.2 6.5
15th	Jan. 72-Dec. 72	-	-	-	...	620 620	233[c] 254[c]	2 550 2 550	732 896	-	-	-
16th	Jan. 73-Dec. 73	-	5 365	2 565	-	-	-	16 847	8 486	643	-	2.5
17th	Jan. 74-Nov. 74	-	19 504	10 096	-	-	-	46 910	19 187	-	-	-

a) Included in DDT column. b) Estimated. c) Spraying is being carried out as emergency measure only.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958 a)	23 137	2 288	9.9	2 220	48	20
1959	46 687	2 703	5.8	2 343	30	330
1960	45 396	997	2.2	912	3	82
1961	21 530	620	2.9	573	-	47
1962	18 794	694	3.7	676	-	18
1963	28 835	1 849	6.4	1 817	7	25
1964	23 186	1 643	7.1	1 615	4	24
1965	27 378	4 237	15.5	4 213	7	17
1966	28 374	2 882	10.2	2 831	8	43
1967	16 991	1 761	10.4	1 741	1	19
1968	22 284	1 530	6.9	1 517	1	12
1969	23 289	671	2.9	666	4	1
1970	22 892	935	4.1	925	10	-
1971	23 893	1 463	6.1	1 462	-	1
1972	29 011	715	2.5	668	47	-
1973	31 068	1 906	6.1	1 883	23	-
1974	50 858	3 783	7.4	3 781	2	-

CONSOLIDATION PHASE AREAS

Year	Estimated population in the area (thousands) (b)	No. of slides examined (c)	% of population sampled (annual rate)	Total No. of positive cases (c)	Origin of infections							Species of parasite		
					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	P. falciparum	P. vivax	P. malariae
							from abroad	from areas within country						
1961	225	14 894	6.6	26	-	-	-	26	-	-	-	23	-	3
1962	240	19 025	7.9	22	-	1	-	21	-	-	-	17	-	5
1963	240	38 861	16.2	33	-	-	-	33	-	-	-	28	3	2
1964	253	53 369	21.1	38	-	-	-	38	-	-	-	35	1	2
1965	262	20 366	7.8	74	-	-	-	74	-	-	-	69	-	5
1966	277	7 411	2.7	51	-	-	-	49	-	-	2	47	3	1
1967	281	8 488	3.0	25	1	-	-	24	-	-	-	25	-	-
1968	303	13 055	4.3	25	-	-	4	17	-	-	4	24	1	-
1969	199d)	14 905d)	7.5	70d)	22	1	-	15	-	4	28	68	2	-
1970	27	25 810	95.6	84	5	-	-	22	-	-	57	84	-	-
1971	39	12 689	32.5	69	-	-	3	11	-	38	17	69	-	-
1972	42	20 340	48.4	84	2	-	-	2	-	71	9	84	-	-
1973	43	18 255	42.5	34	-	-	2	10	-	-	22	34	-	-
1974	45	21 737	48.3	181	6	-	2	40	-	47	86	181	-	-
MAINTENANCE PHASE AREAS														
1971	178	15 724	9.0	14	-	-	-	12	-	-	2	14	-	-
1972	180	10 249	5.7	1	-	-	-	1	-	-	-	1	-	-
1973	184	10 125	5.5	8	-	-	-	8	-	-	-	8	-	-
1974	190	7 644	4.0	20	-	-	-	15	-	-	5	20	-	-

III. SPECIAL TECHNICAL PROBLEMS

A. General status

Ten species of anophelines are regarded as significant in the American Region and of these, four show physiological resistance in part of their area of distribution: A. quadrimaculatus in the United States; A. pseudopunctipennis in Guatemala and Mexico; A. albimanus in Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua and Panama; and A. albitarsis in Colombia and Brazil. In Central America there are areas with A. albimanus resistant to DDT, BHC, dieldrin and malathion in some localities in Gautemala and Nicaragua and in many in El Salvador, the mosquito is resistant to propoxur as well. In addition, resistance of A.albimanus to fenitrothion was noted in El Salvador and Nicaragua in 1971.

The exophily of the vector also represents a major problem in some areas, as in western Venezuela and northeastern Colombia where the vector is A. nuñeztovari, and in southern Brazil in areas with A. (Kerteszia) cruzi cruzi which, besides frequenting dwellings, also transmits malaria in the open. Other anopheline species which have predominantly domestic habits and are in general both endophagous and endophilous, may include larger or smaller groups that bite and rest outside dwellings.

In some regions of Brazil, Colombia, Guyana, Panama, Surinam and Venezuela strains of P. falciparum resistant to chloroquine (grades RI to RIII) have been identified (Map 3).

Other problems affecting the conduct of the program are those associated with human ecology and etiology such as poor housing, frequent modification of sprayed surfaces, the use of temporary shelters for sleeping, migration, the existence of primitive and isolated population groups, increases in anophelism as a result of engineering works, cultural factors and finally operational, administrative and financial difficulties of the anti-malaria services.

In 1974, technical problems calling for new methods of attack were known to exist in ten countries. These problems affect a population of some 8.5 million, i.e., 4.25 per cent of the total population of the malarious area. In addition, problems of human ecology and etiology, difficulties of access and the program's high operating costs, especially in the Amazon basin, are factors in a number of countries. Some 10 million people live in these latter areas so that there are a total of some 18.5 million persons, for whom no firm time-table of protective measures can be projected. This group represents 9.25 per cent of the total population of the malarious area.

Table 23 contains data provided by the countries with respect to areas where progress in solving technical problems is dependent on new measures of attack.

In Colombia seven regions have been identified in various geographical zones (Caribbean, Magdalena River valley, Pacific coastline, Catatumbo valley, Cordillera Oriental, Alto Caqueta and Sarare) where transmission persists despite the application of attack measures over a period of nine years or more. The technical problems encountered in Colombia are related to the vector (physiological or behavioral resistance) and to questions of human ecology and etiology (housing, migration). Operational problems also exist as a result of difficulties of accesss in some areas. The total area affected is estimated at some 105,900 km^2 with a population of 725,300.

Problems in Ecuador are similar to some of those experienced in Colombia, although they affect the program to a lesser extent since they are mainly related to questions of settlement, migration and housing and there is no evidence of serious problems connected with the vector. The area affected is some 40,000 km^2 with a population of 273,000.

The resistance of A. albimanus to various insecticides is the most serious technical problem in El Salvador; it is regarded as the main factor in the persistence of transmission notwithstanding 16 years of coverage with DDT and four years with propoxur, in an area that is relatively small (7,689 km^2) but densely populated (893,299 inhabitants).

In Guatemala the physiological resistance of the vector to the insecticides employed was first observed with dieldrin in 1958, with DDT in 1959 and propoxur in November 1973. Currently A. albimanus is resistant in some areas to the three insecticides (DDT, dieldrin and propoxur). A. pseudopunctipennis and A. vestitipennis are resistant to dieldrin and DDT. Data on behavioral resistance are incomplete.

The area of resistance to DDT represents some 43,000 km^2; resistance to propoxur covers an area of 1,700 km^2. These two areas have an approximate population of 1.3 million, half of them on the Pacific coast where the problem is more acute.

In Haiti a significant and progressive reduction in the susceptibility of A. albimanus to DDT was first noted in early 1968. The scale of the problem of physiological resistance in Haiti has not been precisely determined but the problem areas can be assumed to have a population of some 400,000.

In Honduras the principal vector is also A. albimanus and along the Pacific coast and in the Jamastrán, Talanga and Cedros valleys in the interior this anopheline shows a high degree of physiological resistance to dieldrin and DDT. Propoxur has proved effective in these areas but its application has been limited since March 1974 by shortage of funds. The estimated population of the areas affected by these problems is some 671,000.

In Mexico the vectors (A. albimanus and A. pseudopunctipennis) have shown resistance to insecticides and there have also been problems associated with the habits of local populations, internal migration and modification of sprayed surfaces. The area affected by these problems is large (198,600 km^2) and densely populated (5 million inhabitants); new surveys are being undertaken to determine the present magnitud of the problem.

In Nicaragua three regions are experiencing technical problems mainly associated with the resistance of the vector (A. albimanus) to the insecticides, DDT and malathion and, in some localities, to propoxur. The problem affects some 27,400 km^2 with a population of 1.4 million; the application of propoxur has had a favorable impact on the situation in most of the areas affected (Departments of Chinandega, León, Managua, Carazo, Nueva Segovia, Madriz, Estelí, Matagalpa, Boaco) and has had normal results in other areas but little effect in a number of localities in the municipality of El Rama in the Department of Zelaya.

In Panama in the early 1960's resistance by A. albimanus to dieldrin was noted in various localities in the Donoso district of Colón Province. In 1972 this vector showed physiological resistance to DDT in the Escobal area of Colón District and this phenomenon was subsequently observed in other areas. The problem currently exists in localities in the following provinces: Colón (Colón and Portobelo Districts), Panama (Panama and Chepo Districts), Darien, San Blas and Chiriquí. These problem areas cover some 6,300 km^2, with a population of 21,800. Propoxur has produced good results there.

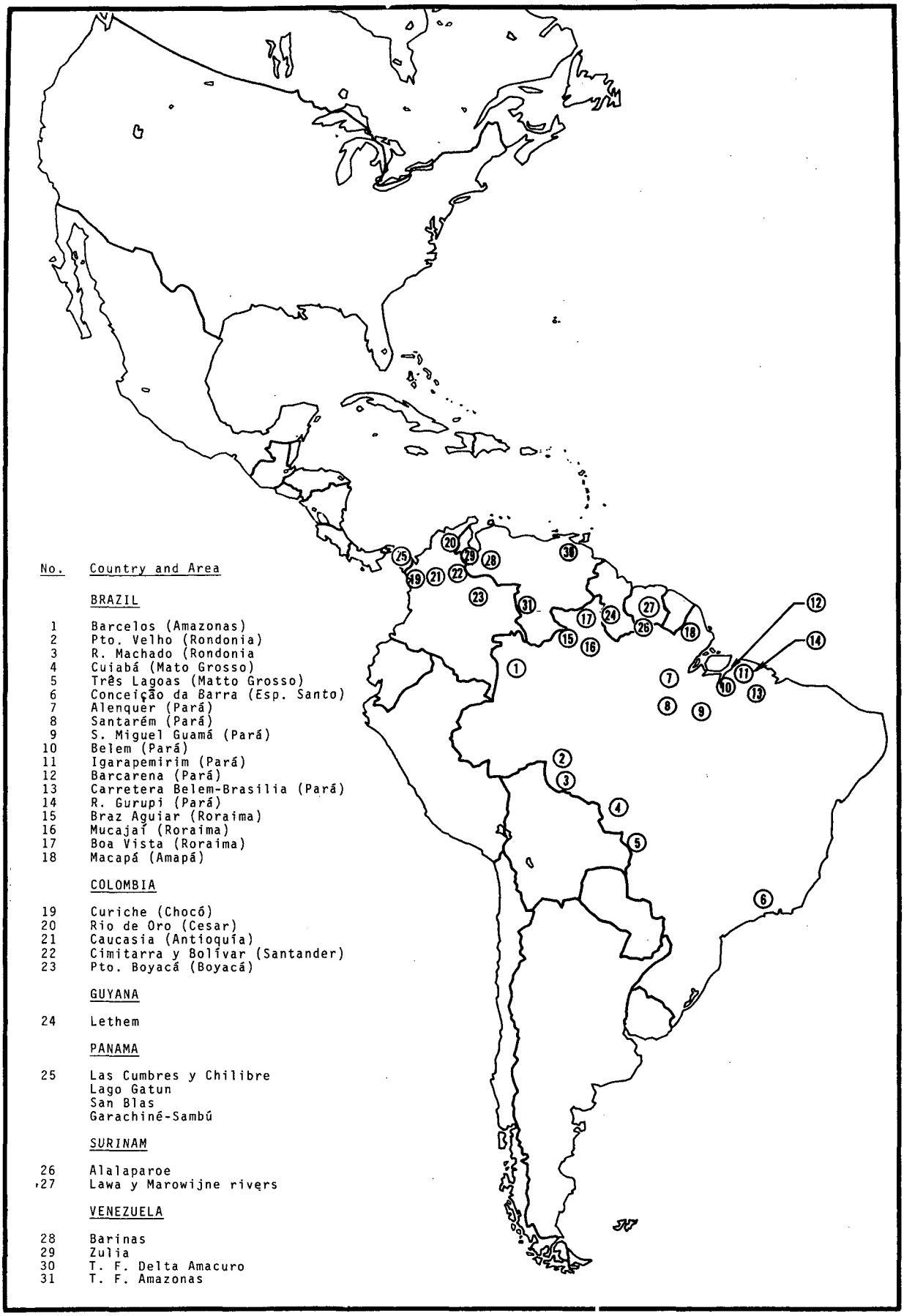
The malaria eradication problems of Venezuela may be classified as technical, operational and administrative. In the western region of the country, the habit of the mosquito A. nuñeztovari of sometimes biting outdoors, together with its practice of coming to rest in the open, reduce the effectiveness of the use of DDT or any other residual compound. In the eastern region, A. emilianus is also exophilous, whereas in the southern maintenance area, A. darlingi shows some degree of excito-repellency to DDT. None of the principal vectors has shown any physiological resistance to DDT. In addition to these problems of a technical character are those associated with human habits, migration, use of temporary dwellings, etc., and operational and access difficulties in the case of areas inhabited by indigenous groups and miners. An estimated area of 140,000 km^2 with a population of 500,000 is affected by these problems.

B. Action to solve technical problems

In countries in which the vector is resistant to DDT, propoxur has been used as an alternative method of attack. In some areas larvicides have been used, although on a restricted scale. The distribution of anti-malarial drugs has been continued with a view to preventing deaths from malaria and reducing the incidence of the disease. Studies of the epidimiology of malaria and on the use of supplementary and alternative attack methods have been continued. Research activities directed toward finding solutions to these problems have been promoted and are dis-dussed in the chapter on research.

MAP 3

AREAS WHERE CASES OF FALCIPARUM RESISTANT TO 4-AMINOQUINOLINES HAVE BEEN NOTIFIED



No.	Country and Area
	BRAZIL
1	Barcelos (Amazonas)
2	Pto. Velho (Rondonia)
3	R. Machado (Rondonia
4	Cuiabá (Mato Grosso)
5	Três Lagoas (Matto Grosso)
6	Conceição da Barra (Esp. Santo)
7	Alenquer (Pará)
8	Santarém (Pará)
9	S. Miguel Guamá (Pará)
10	Belem (Pará)
11	Igarapemirim (Pará)
12	Barcarena (Pará)
13	Carretera Belem-Brasilia (Pará)
14	R. Gurupi (Pará)
15	Braz Aguiar (Roraima)
16	Mucajaí (Roraima)
17	Boa Vista (Roraima)
18	Macapá (Amapá)
	COLOMBIA
19	Curiche (Chocó)
20	Rio de Oro (Cesar)
21	Caucasia (Antioquía)
22	Cimitarra y Bolívar (Santander)
23	Pto. Boyacá (Boyacá)
	GUYANA
24	Lethem
	PANAMA
25	Las Cumbres y Chilibre Lago Gatun San Blas Garachiné-Sambú
	SURINAM
26	Alalaparoe
27	Lawa y Marowijne rivers
	VENEZUELA
28	Barinas
29	Zulia
30	T. F. Delta Amacuro
31	T. F. Amazonas

Table 23

AREAS WHERE PROGRESS DEPENDS ON THE APPLICATION OF NEW ATTACK MEASURES TO SOLVE TECHNICAL PROBLEMS

Country and area	Population (area with problems)	Area Km^2	Insecticide		Principal vector	Causes of problem	Attack measures		Measures planned for 1975
			Kind used	Years of coverage			Applied in 1974	Results obtained	
Colombia									
1 - Caribbean Coastal Zone (Western Region)	376 093	20 915	DDT	15	A. darlingi A. punctimac. A. nuñeztovari A. albimanus A. pseudopunct.	Vector; poor housing; colonization; social problems; parasite resistance	Fortnightly MDA; semestrial sprayings with DDT and HCH	Good	Fortnightly medication; sprayings
Magdalena River Valley (Central Region)	179 838	19 358	"	10	A. nuñeztovari A. darlingi A. punctimac. A. albimanus	"	Semestrial sprayings	No changes	Sprayings
Pacific Coastal Zone (Central Region)	54 971	12 469	"	13	A. neivae A. albimanus	Vector; poor housing; difficult operations; refusal	Fortnightly MDA; semestrial sprayings with DDT	"	Entomological studies; partial spraying
Catatumbo Region	10 085	753	"	11	A. nuñeztovari A. punctimac.	Vector; poor housing; colonization; parasite resistance	Weekly MDA; semestrial sprayings with DDT and HCH	Good	To continue MDA and sprayings
Eastern Slope of Eastern "Cordillera" (Central Region)	57 522	42 846	"	9	A. nuñeztovari A. darlingi A. albitarsis A. punctimac.	"	Health Education; fortnightly MDA; semestrial sprayings	Good	Same as in 1974
Alto Caquetá Region	14 767	3 373	"	11	A. darlingi A. punctimac.	Colonization	Selective fortnightly; education	No changes	Fortnightly MDA; sprayings
Sarare Region	32 107	6 209	"	9	A. nuñeztovari	Vector; poor housing; colonization; refusal	Fortnightly MDA; semestrial sprayings with DDT and HCH	Unsatisfactory	To continue MDA; health education; sprayings
Total	725 383	105 925							
Ecuador									
2 - Esmeraldas	227 700	8 344	"	7	A. punctimac. A. albimanus	Colonization; poor housing	Semestrial sprayings with DDT	Transmission decreased	Same as in 1974
3 - Napo	45 440	32 239	"	7	"	"	Semestrial sprayings with DDT, and MDA (irregular coverage)	Deterioration of the malaria situation	Same as in 1974 (MDA in an area of 6,000 inhabitants)
Total	273 140	40 583							

Table 23 (Cont.)

AREAS WHERE PROGRESS DEPENDS ON THE APPLICATION OF NEW ATTACK MEASURES TO SOLVE TECHNICAL PROBLEMS

Country and area	Population (area with problems)	Area Km^2	Insecticide		Principal vector	Causes of problem	Attack measures		Measures planned for 1975
			Kind used	Years of coverage			Applied in 1974	Results obtained	
El Salvador									
4 - Coastal area	893 299	7 689	DDT Propoxur	17 4	A. albimanus	Vector resistance	Sprayings with Propoxur	Unsatisfactory	Selective medication in areas with vector resistant to Propoxur, in other areas, Propoxur will continue
Guatemala									
5 - Southern coast	1 307 235	43 000	DDT	11	A. albimanus A. pseudopunct. A. vestitipennis	Vector resistance to DDT, DLN and Propoxur	Selective application of insecticides and chemotherapy	In observation	Same as in 1974
Haiti									
6 - Cité Simone O. Duvalier	21 394	2.8	DDT	6	A. albimanus	Vector resistance	Drainage and larvicides	Good	Same as in 1974
Jackmel	9 850	-	"	12	"	"	-	-	Drainage and usage of other insecticide
Valle de la Coma	13 500	5.3	"	12	"	Migrations	MDA; larvicides	-	Same as in 1974
Gross-Morne	16 150	4.8	"	12	"	Vector resistance	Mass drug treatment	Satisfactory	"
Southeast area	300 000	3 500.0	"	12	"	"	MDA; larvicides	"	MDA and usage of other insecticide
Petit-Goave	31 000	60.0	"	12	"	"	Propoxur spraying	"	Same as in 1974
Bois Neuf	19 000	72.0	"	12	"	"	MDA; fogging	"	"
Total	410 894	3 644.9							
Honduras									
7 - South area Valle de Jamastran Valles de Talanga y Cedros	671 215	5 436	DDT DLN MAL Propoxur	6 1 1 1/2	A. albimanus A. pseudopunct.	Resistance to DDT and DLN; internal and external migration of the population	Sprayings with Propoxur	Very satisfactory	Quarterly sprayings with Propoxur

Table 23 (Cont.)

AREAS WHERE PROGRESS DEPENDS ON THE APPLICATION OF NEW ATTACK MEASURES TO SOLVE TECHNICAL PROBLEMS

Country and area	Population (area with problems)	Area Km^2	Insecticide		Principal vector	Causes of problem	Attack measures		Measures planned for 1975
			Kind used	Years of coverage			Applied in 1974	Results obtained	
Mexico									
8 - Basins of Rivers Fuerte, Sinaloa, Humaya and Tamazola	618 820	39 935	DDT DLN[b]	17[a]	A. pseudopunct. A. albimanus	Internal migration; incipient resistance; poor housing; aggressions of sprayed surfaces	Semestrial spray. with DDT; treatment of cases and collaterals by spraying personnel	Transmission persists	Same as in 1974, no new measures to be applied
9 - Huicot	109 119	27 323	DDT DLN	17[a]	A. pseudopunct.	Population movement; poor housing; aggressions of sprayed surfaces; temporary shelters	Semestrial spray. with DDT; treatment of cases and collaterals by spraying personnel	"	"
10 - Basin of Balsas River	2 007 678	70 785	DDT DLN	17[a]	A. pseudopunct. A. albimanus	Aggres. of sprayed surfaces; intensive population movement; poor housing; partial resist. of A.pseudop.	"	Transmission decreased	"
11 - "Costa Chica" of Guerrero and Oaxaca coastal	657 122	34 064	DDT DLN	17[a]	"	Aggres. of sprayed surfaces; poor housing; temporary shelters and modification of houses; population movements; incipient resistance	DDT spray. every 3 months; radical cure treatment of cases and collaterals in positive localities; field research on P.falc.resistance by specific pers.	Transmission of P. falciparum decreased and also P. vivax cases decreased	Same as in 1974, no new measures have been planned
12 - "El Istmo" Northeastern slope of the Golf of Mexico Oaxaca State	195 721	16 612	DDT DLN	17[a]	"	Internal population movement; poor housing; aggressions of sprayed surfaces	Semestrial spraying with DDT; radical cure treatment by spraying personnel	Transmission decreased	"
13 - Tapachula-Suchiate	267 634	4 443	DDT DLN	17[a]	"	Partial resistance of A. albimanus to DDT; migration movements with Guatemala	"	"	"

a) Irregular cycles and dosifications; in 1968 and 1969 one spraying cycle was carried-out due to financial problems. b) Dieldrin was used up to 1959.

Table 23 (Cont.)

AREAS WHERE PROGRESS DEPENDS ON THE APPLICATION OF NEW ATTACK MEASURES TO SOLVE TECHNICAL PROBLEMS

Country and area	Population (area with problems)	Area Km^2	Insecticide		Principal vector	Causes of problem	Attack measures		Measures planned for 1975
			Kind used	Years of coverage			Applied in 1974	Results obtained	
Mexico (Cont.)									
14 - Central part of Chiapas State	196 869	5 448	DDT, DLN[b]	17[a]	A. pseudopunct.	Population movement; area with difficult accessibility; aggressions of sprayed surfaces	Semestrial spray. with DDT; radical cure of cases and collaterals (2nd semester) by spraying personnel	Transmission persists	Same as in 1974. No new measures have been planned
Total	4 052 963	198 610							
Nicaragua									
15 - Pacific Region, Departments Chinandega, León, Managua, Carazo, Masaya, Granada and Rivas	1 037 700	16 023	DDT MAL Propoxur	4 4 4 3/4	A. albimanus	Vector resistance to DDT and Malathion	Quarterly spray. with Propoxur, 4 cycles a year	Favorable	Quarterly cycles with Propoxur; (4 times a year)
16 - Central Region Depts. Nueva Segovia, Madriz, Estelí, Matagalpa, Boaco Chontales	341 214	11 208	DDT MAL Propoxur	4 5 4 1/2	"	Vector resistance to DDT, Malathion and in some localities to Propoxur	"	"	"
17 - Atlantic Region Zelaya Department (El Rama municipality)	30 000	150	DDT MAL Propoxur	4 1 4 1/2	"	Vector resistance to DDT	"	"	"
Total	1 408 914	27 381							
Panama									
18 - Lago Gatún	1 405	51	DDT	11	A. albimanus	Vector and parasite resistance	Spraying with Propoxur; usage of alternative drugs	Satisfactory	Same as in 1974
Transismica and Portobelo	3 634	211	DDT	11	"	"	"	"	"

a) Irregular cycles and dosifications; in 1968 and 1969 one spraying cycle was carried-out due to financial problems. b) Dieldrin was used up to 1959.

Table 23 (Cont.)

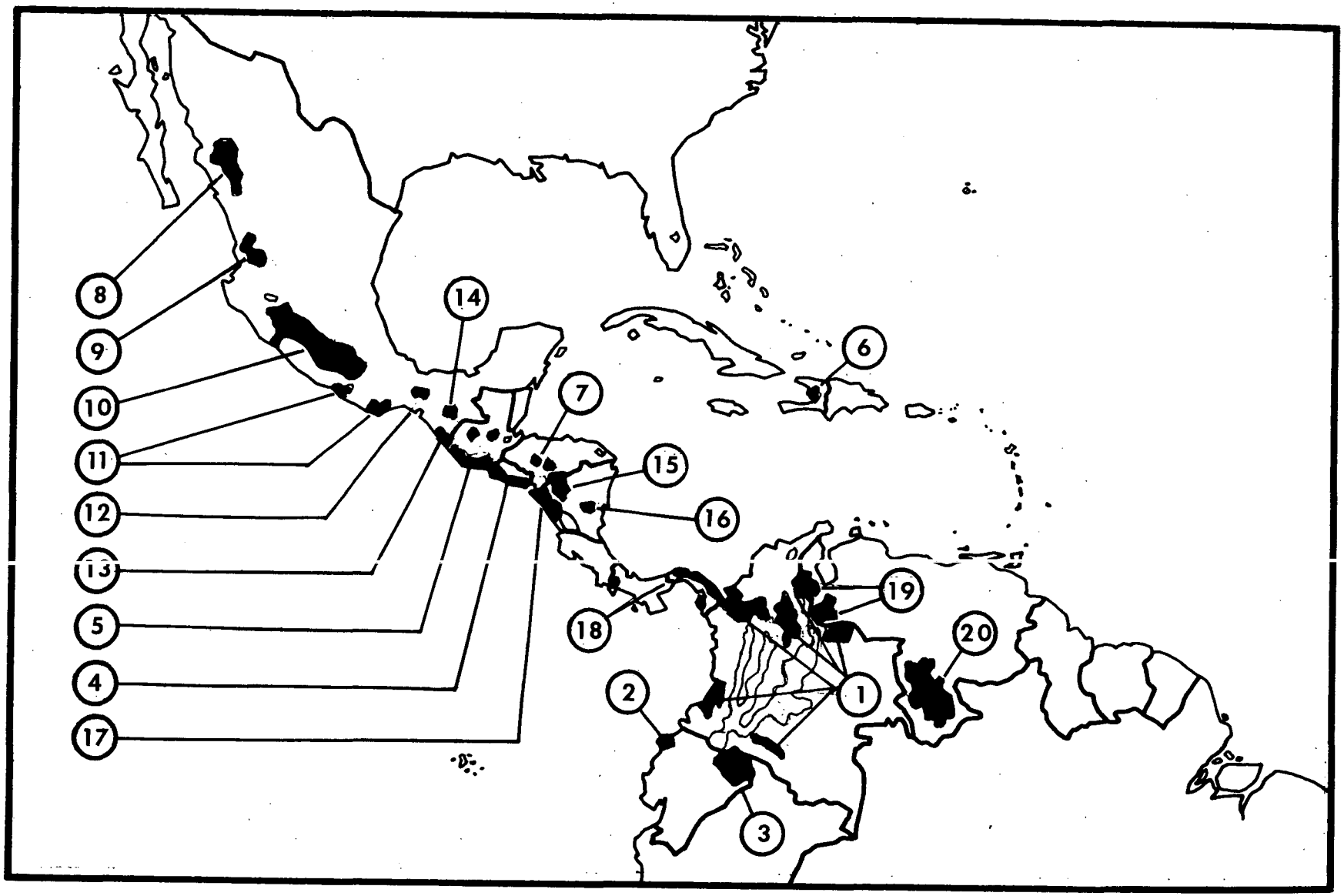
AREAS WHERE PROGRESS DEPENDS ON THE APPLICATION OF NEW ATTACK MEASURES TO SOLVE TECHNICAL PROBLEMS

Country and area	Population (area with problems)	Area Km^2	Insecticides		Principal vector	Causes of problem	Attack measures		Measures planned for 1975
			Kind used	Years of coverage			Applied in 1974	Results obtained	
Panama (Cont.)									
Jaqué	3 376	1 496	DDT	12	A. albimanus	Poor housing	Propoxur	Satisfactory	Same as in 1974
Garachiné-Sambú	3 968	1 412	DDT	12	"	Vector and parasite resistance	Propoxur and drugs	"	"
Chinina (Chepo)	1 480	455	DDT	12	"	Vector resistance	Propoxur	"	"
San Blas	3 777	2 474	DDT	12	"	Vector and parasite resistance	Propoxur and drugs	"	"
Baru	4 156	203	DDT	12	"	Vector resistance	"	Satisfactory; transmission interrupted	Spraying with Propoxur if transmission persists
Total	21 796	6 302							
Venezuela									
19 - Occidental area	419 351	19 738	DDT	24	A. nuñeztovari	Exophily of vector; migration of population; colonization; reluctance or lack of collaboration from the population	Intradomiciliary spraying with DDT; deposit of drugs in houses; radical cure to P.falc. infections; mass drug treat. (weekly cycles) to population with high parasite incidence	Focalization of areas with high malaria incidence	Intradomiciliary spraying with DDT; peridom. fogging with organophosphorus insecticides; mass drug treatment; deposit of Chloroquine in houses; radical cure to P. falciparum infections
20 - Southern area	82 767	120 208	DDT	24	A. darlingi	"	Intradomiciliary spraying with DDT; deposit of drugs in houses; radical cure to P.falc. infections	"	"
Total	502 118	139 946							

Map 4

GEOGRAPHICAL DISTRIBUTION OF AREAS OF TECHNICAL PROBLEMS

(SHOWN IN TABLE NO. 23)



IV. RESEARCH

The Organization continues to support operational research projects for the evaluation of attack measures which appear promising for use in areas where available methods are insufficient; assistance is provided to countries in the epidemiological study of their problem areas. The Organization also encourages and supports research in the development of new methods of control.

A. Evaluation of insecticides

In view of the low cross resistance between propoxur and landrin (OMS-597), field research trials of landrin were carried out to evaluate its effect, especially in areas where A. albimanus is resistant to propoxur. The The results obtained in 1974 confirmed those of 1973 with respect to the good effect of this insecticide where no carbamate resistance is present. Nevertheless, the evaluation of its effect as a possible substitute for propoxur had to be discontinued, as landrin ceased to be commercially available.

Studies in stage IV of trials of methyl-dursban (OMS-1155) on Anopheles albimanus showed that this insecticide has a very short residual effect and it therefore is not very promising for use as an antimalaria attack measure.

Studies at stages III/IV were carried out on sprayed panels of different local types of materials used in house building of chlorphoxim (OMS-1197),jodfenphos (OMS-1211), and dursban (OMS-971). All these insecticides produced lower mortalities in the propoxur-resistant than in the propoxur-susceptible colonies of A. albimanus, although chlorphoxim may still be sufficiently effective for malaria control.

A comparative study of the effects of DDT and propoxur in areas where there is resistance to both insecticides suggested that both still had appreciable effects on malaria transmission and that there was no significant difference between the two insecticides.

B. Studies related to other attack measures

Efforts were made for the establishment of colonies of larvivorous fish and to identify local larvivorous fishes which may exist.

Mass distribution of antimalarial drus as an attack measure against malaria is being used in some areas in various countries of Central and South America. In vivo and in vitro studies to determine the extent and intensity of the resistance of P. falciparum to chloroquine and to pyrimethamine continued in Colombia, Surinam, Panama and Venezuela. In the latter a comparative study is being carried out of combinations of different sulfonamides with pyrimethamine.

C. Immunological studies

The Organization continues to aid in the financial support of research carried out by the Department of Preventive Medicine of the University of New York for the development of a method of active immunization against malaria, the prospects for which appear to improve as time passes.

It has been shown that persons may be solidly immunizes against P. falciparum and P. vivax for a period from 3 to 6 months. This can be obtained by causing the person to be bitten by large numbers of infected mosquitos previously irradiated.

Research continues on the nature and methods for the purification of the most active antigens, on practical routes of administration and on practical ways of mass production of immunizing agents, especially through in vitro cultivation of malaria parasites.

Active efforts continue in the study of the immune response and the exploration of other possible methods of active immunization. Merozoites have been used with very successful results in a monkey model.

D. Serological studies

In collaboration with the Malaria Eradication Service of Costa Rica a study is being carried out of the use of serological diagnostic methods as a complement to parasitological examination of blood smears for improving knowledge of epidemiological situation.

Assistance was provided to the Malaria Eradication Service of Mexico for the training of personnel and the setting up of a malaria serological laboratory.

In collaboration with the Malaria Eradication Service of Guyana and the Center for Disease Control of the US Public Health Service, a study of malaria serology was completed which permitted the identification of some areas where a degree of malaria transmission had persisted, although the parasitological methods of evaluation routinely used by the Service had shown them to be negative.

E. Entomological studies

In collaboration with the Department of Entomology of the University of California (Riverside) the mechanism of resistance to organophosphorus and carbamate insecticides continued under study as well as the extent of cross resistance to other insecticides.

Cytogenetical studies of certain South American vectors continued in collaboration with the Malaria Eradication Services of Colombia, Brazil, Peru and the Department of Zoology of the University of Illionois.

F. Research on economic impact of malaria

Analysis was completed of a multitude of factors and indicators for studying the impact of malaria on the microeconomy of rural areas in Paraguay. The results can be found in Scientific Publication No. 297, PAHO, 1975.

V. TRAINING

All national malaria eradication services undertake training activities directly related to the program. In addition, in some countries such as Colombia, Costa Rica, Ecuador and the Dominican Republic, these Services conduct short courses on other health activities, vector control (A. aegypti) and control of other diseases preventable by immunization.

In Guyana, UNICEF sponsored a course attended by 19 sanitarians from the Malaria Service, designed to enable them to assume polyvalent health functions.

Both in Brazil and in Mexico the national programs have held courses to meet their own special needs: the course in Mexico concentrated on malaria alone whereas the Brazilian course included other endemic diseases (schistosomiasis, Chagas disease plague, leishmaniasis, yellow fever, filariasis, trachoma and yaws).

In Ecuador training courses were held with a view to providing support services for the family planning program, especially in the field of community information and promotion.

In Venezuela the Ministry of Health and Social Welfare continues to provide courses in malariology and environmental sanitation totaling, 1,140 hours. The Organization provides travelling expenses for six foreign students who are awarded fellowships by the Government of Venezuela and, in addition, several Organization fellowships to enable candidates from additional countries to participate.

In Peru the University of San Marcos held a course in vector genetics with PAHO support and participation.

In addition to the above courses, PAHO sponsored the training of personnel in the serological diagnosis of malaria in Costa Rica and in the United States and awarded a fellowship for training one physician in immunology at New York University, in the United States.

During 1974, 8 PAHO malariologists received training in A. aegypty eradication techniques. In addition one attended a course in health planning, one studied

for a master's degree in public health and a third followed a course in sanitary engineering.

Finally it should be noted that a working party has been formed with a view to organizing a course for a master's degree in public health with the principal emphasis on malaria and other parasitic diseases; the course is to be held in the School of Pulbic Health of Mexico. Directors of the School of Public Health and the Director General of Public Health Research (both agencies of the Ministry of Public Health and Social Welfare of Mexico) as well as representatives of the Ecological Research Center of Southeastern Mexico (part of the Autonomous University of Mexico) are participating in this working party together with PAHO/WHO representatives. It is expected that the first course will be held in 1976.

VI. INTERNATIONAL COOPERATION

PAHO/WHO continued to support the continental malaria program through the assignment of full-time professional and technical personnel and short-term consultants to country and inter-country projects. Table 24 shows the number of medical officers, sanitary engineers, entomologists, sanitary inspectors, and other professional staff members who were assigned to projects during the period 1972-1975.

In addition to the assignment of personnel, PAHO/WHO provides limited quantities of supplies and equipment to national programs. Within the limits of available resources, priority has been given since 1958 to the provision of anti-malarial drugs for the presumptive treatment of febrile cases and for radical-cure treatment of confirmed cases; the quantities and types of drugs provided to the countries in 1974 and accumulated amounts provided to them between 1958 and 1973 are also shown in Table 25. During the year, the Organization also provided miscellaneous supplies and equipment in support of field operations, entomological studies, and parasitological laboratories.

The Government of Venezuela continued its policy of granting six fellowships to candidates selected by the Organization for training at the School of Malariology and Environmental Sanitation in Maracay, Venezuela. The cost of travel to Venezuela of six fellows from the countries of Bolivia, Hiati, Nicaragua, Panama, and two from Peru was defrayed by PAHO/WHO with other expenses of the participants in the course being absorbed by Venezuela. In addition, UNICEF sponsored a training course in one country for the training of malaria service personnel in polyvalent health activities.

Inter-country meeting between Argentina and Paraguay, Belize and Guatemala, Mexico and Belize, Mexico and Guatemala, Brazil and Paraguay, Colombia and Panama, Costa Rica and Panama, and French Guiana and Surinam were held for the purpose of exchanging information and coordinating operational and surveillance activities. The Organization participated in the meetings and in collaboration with the Government of Ecuador developed plans for the biennial meeting of the Directors of Malaria Programs which was held in Quito, Ecuador early in 1975.

The contributions of PAHO, WHO and US/AID to malaria programs in 1974 and estimated amounts for 1975 are shown in Table 26. While no monetary estimates are available concerning contributions from UNICEF, other international organization, or other countries providing bilateral assistance, it should be noted that a number of national malaria programs which have undertaken additional health responsibilities have benefited from contributions of supplies and equipment from such institutions in support of expanded health services. In addition, numerous agencies and governments provided assistance to Honduras to offset the devastating effects of Hurricane Fifi.

Table 24

PAHO/WHO FULL-TIME PROFESSIONAL AND TECHNICAL STAFF ASSIGNED TO COUNTRY, INTER-COUNTRY, AND INTER-ZONE MALARIA ERADICATION PROGRAMS IN THE AMERICAS, FROM 1972 TO APRIL 1975*

Country or other political or administrative unit	Medical Officers				Sanitary Engineers				Sanitary Inspectors				Entomologists				Others			
	1972	1973	1974	1975	1972	1973	1974	1975	1972	1973	1974	1975	1972	1973	1974	1975	1972	1973	1974	1975
Bolivia	1	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Brazil	4	4	3	3	1	2	1	1	1	-	-	-	1	1	-	-	-	-	3 a)	3 a)
Colombia	1	1	1	-	-	-	-	-	3	3	2	3	-	-	1	1	-	-	-	-
Costa Rica	1	1	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1 b)	1 b)
Dominican Republic	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Ecuador	1	1	1	1	-	-	-	-	1	1	2	2	-	-	-	-	-	-	-	-
El Salvador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-
El Salvador-0201	-	-	1	1	-	-	-	-	-	-	2	2	-	-	2	2	-	-	-	-
Guatemala	1	1	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	1 c)	1 c)
Haiti	2	2	1	1	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Honduras	1	1	1	1	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Mexico	1	1	1	-	1	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-
Nicaragua	2	2	1	1	-	-	-	-	2	1	-	-	-	1	-	-	-	-	-	-
Panama	2	1	-	-	1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	-
Paraguay	1	1	1	1	1	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Peru	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belize	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Surinam	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-
ME Dept., Inter-zone or	11	11	6	5	1	1	1	1	2	2	-	-	3	2	-	-	4 d)	5 e)	1 f)	1 f)
Total	32	31	21	19	8	9	6	6	18	14	12	14	6	6	5	5	4	5	6	6

* From 1972 to 1974 as of 31 December of each year; 1975 up to April.

a) One parasitologist, one assistant engineer and one laboratory adviser. b) Parasitologist. c) Administrative methods officer. d) One economist, two administrative methods officers and one laboratory adviser. e) One economist, one statistician, two administrative methods officers and one laboratory adviser. f) Economist.

Table 25

DRUGS PROVIDED BY PAHO/WHO TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1958-1974

(In thousands of tablets)

Country or other political or administrative unit	Total 1958-1973[a]								1974						
	Chloroquine 150 mg.	Primaquine		Pyrimethamine 25 mg.	Combined drug[b]	Aspirin		Fanasil	Chloroquine 150 gm.	Primaquine		Pyrimethamine 25 mg.	Combined drug[b]	Fanasil
		15 gm.	5 gm.			0.50 g.	0.20 g.			15 mg.	5 mg.			
Argentina	2 018	399	222	712	-	-	-	-	-	-	-	-	-	-
Bolivia	9 420	1 375	691	856	570	200	-	12	200	50	-	2	50	1
Brazil	129 535	2 114	1 025	265	2 119	-	-	202	2 000	30	27	40	184	47
Colombia	31 395	2 603	830	6 649	11 592	100	20	176	1 000	40	-	-	-	163
Costa Rica	6 694	1 103	457	213	1 385	227	81	-	300	50	30	-	-	-
Cuba	4 350	38	69	80	-	-	-	-	-	-	-	-	-	-
Dominican Republic	14 230	91	225	847	306	10	10	-	-	-	-	-	-	-
Ecuador	14 436	1 116	261	430	1 013	-	-	-	250	20	5	-	-	-
El Salvador	19 205	928	902	128	2 070	-	-	-	700	37	13	-	-	-
Guatemala	17 933	1 292	341	127	8 049	200	50	2	400	-	25	-	-	-
Guyana	987	269	99	338	-	30	-	25	-	-	-	-	-	-
Haiti	11 670	102	5	1 480	31 608	-	-	-	750	-	-	-	-	-
Honduras	14 809	1 584	1 235	88	1 290	-	-	-	881	440	40	-	-	-
Jamaica	879	18	-	288	50	-	-	-	-	-	-	-	-	-
Mexico	79 916	10 636	15 372	10 679	4 432	-	-	-	1 000	300	-	-	1 010[c]	-
Nicaragua	12 209	2 398	2 155	156	6 933	-	-	-	900	140	-	-	-	-
Panama	6 540	1 046	483	462	1 787	-	-	25	120	-	50	-	-	3
Paraguay	11 612	256	118	68	76	-	-	8	350	-	-	3	-	3
Peru	25 056	1 589	708	2 777	4 089	433	40	-	200	50	25	23	-	-
Trinidad and Tobago	815	940	419	121	400	112	20	-	-	-	-	-	-	-
Belize	526	55	87	6	22	61	79	-	36	12	10	-	-	-
Canal Zone	-	-	-	-	90	-	-	-	-	-	-	-	-	-
Dominica	90	1	1	45	-	40	-	-	-	-	-	-	-	-
French Guiana	328	103	47	36	48	-	-	-	60	120	-	5	-	5
Grenada	43	-	-	45	-	20	-	-	-	-	-	-	-	-
St. Lucia	68	1	-	70	-	36	-	-	-	-	-	-	-	-
Surinam	2 805	199	73	886	265	128	10	5	300	245	120	-	-	5
Total	417 569	30 256	25 825	27 852	78 194	1 597	310	455	9 447	1 534	345	73	1 244	227

a) During this period, Chloroquine, Primaquine, Pyrimethamine powder, and Tricalcium phosphate have been provided to different projects. b) Chloroquine/Primaquine combined (adult and infant size). c) Includes160,000 Tabs. Daraclor (Chloroquine/Pyrimethamine combined).

Table 26

INTERNATIONAL CONTRIBUTIONS TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS
1974 AND ESTIMATED 1975

(U.S. dollars)

Country or other political or administrative unit	Date of initiation of total coverage	1974			1975 (estimated)		
		PAHO	WHO and WHO/TA	AID (USA) (fiscal year)[a]	PAHO	WHO and WHO/TA	AID (USA) (fiscal year)[a]
Argentina	Aug. 1959	2 387	-	-	5 000	-	-
Bolivia	Sep. 1958	52 239	-	-	44 937	-	-
Brazil	Aug. 1959	259 456	8 515	-	264 444	30 710	-
Colombia	Sep. 1958	136 252	-	-	118 832	-	-
Costa Rica	Jul. 1957	36 515	37 361	-	36 437	39 660	-
Dominican Republic ..	Jun. 1958	7 415	23 010	-	-	27 700	-
Ecuador	Mar. 1957	82 234	-	-	92 570	-	-
El Salvador	Jul. 1956	34 510	84 675	-	40 437	99 200	-
El Salvador-0201		53 431	176 985	-	60 952	168 650	-
Guatemala	Aug. 1956	89 852	34 060	-	86 429	34 650	-
Haiti	Jan. 1962	75 568	-	1 200 000	87 716	-	1 000 000
Honduras	Jul. 1959	-	76 382	-	-	71 800	-
Mexico	Jan. 1957	91 247	36 702	-	52 066	36 000	-
Nicaragua	Nov. 1958	16 498	28 914	-	6 409	42 760	-
Panama	Aug. 1957	28 932	91 710	-	27 436	66 540	-
Paraguay	Oct. 1957	49 505	-	-	38 787	-	-
Peru	Nov. 1957	39 320	-	-	38 137	-	-
Venezuela		-	5 701	-	-	-	-
Belize	Feb. 1957	25 632	-	-	26 836	-	-
French Guiana	Sep. 1963	97	-	-	5 000	-	-
Surinam	May 1958	-	20 163	-	-	34 900	-
Inter-country projects and general services		213 138	246 846	-	174 023	244 675	-
Total		1 294 228	871 024	1 200 000	1 206 448	897 245	1 000 000

a) AID loans are shown in Table 21.