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STATUS OF MALARIA ERADICATION IN THE AMERICAS

XXII REPORT

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REPORT ON THE STATUS OF MALARIA ERADICATION IN THE AMERICAS

XXII REPORT

Introduction

The Director of the Pan American Sanitary Bureau has the honor to present to the XIX Pan American Sanitary Conference the XXII Report on the Status of Malaria Eradication in the Americas.

Between 1956-1959, all countries in the Americas where malaria was a problem initiated their malaria eradication programs, using residual house spraying with insecticides as the principal attack measure. The initial results obtained through a coordinated campaign against this disease were spectacular and by the end of 1964, 56.5 per cent of the population in the originally malarious areas was freed from malaria infection. However, in the last 10 years, the program has met with a number of difficulties of a financial (administrative), operational and technical nature; resulting in a slowing down of progress. At the end of 1973, the population freed from the risk of infection reached 68.3 per cent, and the aim is at 90.7 per cent by the end of the decade, according to the target set by the Third Special Meeting of Ministers of Health of the Americas.

At the Twenty-seventh World Health Assembly, antimalaria programs were discussed with great concern and subsequently the Assembly adopted the following Resolution for development of antimalaria program:

> "The Twenty-seventh World Health Assembly,
>
> Noting the report of the Director-General that describes the state of development of antimalaria programmes;
>
> Recognizing that malaria is resurging in parts of the world, has never been controlled in other parts, and remains a disease the control of which is of the highest priority;
>
> Believing that the revised strategy adopted by the Twenty-second World Health Assembly is an effective strategy, but for a variety of reasons has not been effectively implemented,
>
> REQUESTS the Executive Board thoroughly to review the problem and national and international priorities, and report to the Twenty-eight World Health Assembly."

In the light of the above Resolution, this report presents the current status of the malaria eradication programs in this Region and gives an overall review of progress since the initiation of the malaria eradication campaign. The report consists of five chapters. The first gives an overall review of progress and the problems encountered and the second the present status of the programs in general and country by country. The third chapter summarizes special technical problems, the fourth, research activities undertaken and the fifth refers to international cooperation in the programs.

Information was provided by the countries in an annual questionnaire and in periodic statistical reports, supplemented by data from research reports and information obtained in the countries by consultants of PAHO Headquarters, Zone Offices and country projects.

I. OVERALL REVIEW OF MALARIA ERADICATION PROGRAMS

At the XIV Pan American Sanitary Conference, held in Santiago, Chile, in 1954, it was unanimously agreed to carry out a program for the eradication of malaria throughout the Hemisphere. In 1955, the VII World Health Assembly extended this proposal worldwide. Following this decision all countries in the Americas where malaria transmission existed had their malaria eradication programs in full operation by 1959. The global costs of the program over the last 17 years (1957-1973 inclusive) amount to approximately USA$749,052,000. Of this total, the Governments have

contributed $606,414,000 or 81.0 per cent (including $36,761,000 from AID loans); AID (in grant), $50,003,000 or 6.7 per cent; UNICEF, $47,321,000 or 6.3 per cent; the Federal Republic of Germany, $2,546,000 (estimated) or 0.3 per cent and PAHO/WHO, $42,768,000 or 5.7 per cent.

Of the existing 47 political or administrative units in the Americas, 34 have areas which were originally malarious. Based on the progress achieved, these 34 units can be categorized into three groups. Table 1 shows the countries and population in each group.

Group I: This group has 12 political units, in which malaria has been eradicated, five had interrupted or virtually interrupted transmission by 1957 and seven did so after the initiation of a coordinated eradication campaign. All these 12 units had their status of malaria eradication registered or recorded between 1957 and 1973, Cuba being the country which has most recently entered in this group. Vigilance activities through health services have been carried out effectively and no major problems are foreseen in maintaining malaria free status in the future.

Group II: There are eight political units in which malaria eradication can be achieved in their entire territories within time limits, judging from the progress made as of this date. However, there still exist some residual foci which require further efforts for their elimination. All these units border directly on other countries where malaria transmission still occurs and therefore they are constantly exposed to reinfection. A good and active vigilance system is essential to eliminate active foci of infection stemming from imported cases. Although integration of malaria surveillance activities into the general health service is the ultimate goal for these countries, it will be unwise to reduce or divert the resources allocated to the program to other activities, so long as the danger of reinfection continues and/or the network of malaria surveillance is not complete.

Group III: This group has 14 political units, in which malaria transmission still occurs. Nine have eradicated malaria or have interrupted transmission in part of their territory, but in the remaining areas malaria transmission has been persistent. This group has shown slow or little progress during the last 10 years. The existence of persistent malaria transmission in part of the territory constitutes not only a major difficulty in itself, but also produces sources of infection for the other part of the country and for the countries in Groups I and II where malaria eradication has been achieved or transmission interrupted. The reasons for persistent transmission are multiple and often interrelated. The physiological or behavioral resistance of some important vectors to DDT in certain areas has made it necessary to use more expensive alternative insecticides or complementary measures; the intensive agricultural reform programs and construction of roads and dams by most of the countries have created more favorable ecological conditions for transmission and movement of laborers between non-endemic and endemic areas; inflation and recent energy crisis have generated high-operating costs and difficulties in the procurement of the needed insecticides; shortage of professional staff to direct and supervise eificient field operations and frequent turnover of field personnel due to inadequate remuneration and incentive are considered to be the most important obstacles to the normal progress of the programs requiring adequate financial resources for effective solution. In some countries, difficulties of access to certain remote areas and social insecurity which prevents safe operation in some communities also have been a problem in assuring an adequate coverage with antimalaria measures.

The capital invested in malaria eradication since 1957, although it has not yet accomplished the desired objective of complete eradication of the disease from the entire Hemisphere, has been able to assure 12 political units (Group I) completely free of the risk of malaria infection and another eight units (Group II) to reach the same status in the near future if current progress continues. The population in these 20 units totals 79,849,000 persons or 40.8 per cent of the total in the originally malarious areas. Of the remaining 14 political units (Group III), malaria has been eradicated or transmission interrupted among 56,349,000 inhabitants (28.8 per cent of the total population in the originally malarious areas), leaving 59,330,000 inhabitants (30.4 per cent) in areas where further efforts are required to interrupt malaria transmission. It is this last part of the population that will determine the success of the coordinate malaria eradication campaign in this Hemisphere and the majority of this population live in areas where economic development is under way. Setbacks in the program could result in resurgence of the original endemicity, which would not only affect the health of the population but also jeopardize the progress of the economic development of the country. The objective of eradication as a final goal should therefore be pursued, conserving the gains and solving the problems step by step with whatever means available and with the necessary resources.

Table 1

CLASSIFICATION OF MALARIA ERADICATION PROGRAMS IN RELATION TO PROGRESS ACHIEVED
AS OF 31 DECEMBER 1973

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)
Cuba	3 115	Argentina	3 006	Bolivia	1 025	695
Chile	214	Costa Rica	604	Brazil	18 776	22 713
Grenada and Carriacou	37	Dominican Republic	4 467	Colombia	9 292	4 355
Jamaica	1 559	Guyana	780	Ecuador	1 644	2 232
Trinidad and Tobago	828	Panama	1 510	El Salvador	0	3 250
U. S. A. (Continent)	58 143	Canal Zone	48	Guatemala	0	2 152
Puero Rico	2 715	Paraguay	1 991	Haiti	0	3 760
Virgin Islands	64	Belize	132	Honduras	468	1 958
Dominica	14		-	Mexico	13 037	14 336
Guadeloupe	306		-	Nicaragua	0	2 073
Martinique	216		-	Peru	3 924	1 266
St. Lucia	100		-	Venezuela	7 912	502
	-		-	French Guiana	44	6
	-			Surinam	227	32
12 Units	67 311 34.4%	8 Units	12 538 6.4%	14 Units	56 349 28.8%	59 330 30.4%

In view of the complexity and magnitude of the problems already mentioned, it is unlikely that a single method such as house spraying with insecticides will solve the problem everywhere nor is it likely that the fight against malaria will progress at the same rate in all 14 political units. It is necessary to consider individual problems locally and to apply remedial measures in each country or even in different areas within a country, in order to obtain the maximum effect with the funds invested. Intensification of research to develop more effective and less laborious methods is equally essential to attain the final goal.

II. PRESENT STATUS OF MALARIA ERADICATION PROGRAMS

A. General situation

The estimated population of the Americas at 31 December 1973 was 535,109,000, of which 195,528,000 (36.5 per cent) reside in originally malarious areas. Of the latter figure, 87,969,000 (45.0 per cent) reside in areas in the maintenance phase; 45,535,000 (23.3 per cent) in consolidation; 61,915,000 (31.7 per cent) in areas in the attack phase and 109,000 (0.1 per cent) in areas in which no antimalaria program has been undertaken. Compared with the status at 31 December 1972, there was a progress in the programs of Costa Rica and Paraguay; in Costa Rica an area with 220,000 inhabitants was transferred from attack to consolidation and in Paraguay an area with 1,158,000 inhabitants. No other country changed areas from one phase of the program to another during 1973. As a result, the population in the maintenance and consolidation phases increased from 67.5 per cent to 68.3 per cent, a net gain of 0.8 per cent of the total population in the malarious area. To facilitate the appreciation of the evolution of the program, the population in different phases is given in Table 2, year by year from 1958 to 1973. Maps 1 and 2 show the geographical extension according to the different phases of the program as of December 1972 and 1973 and Tables 3 and 4 give the population an area in km^2 by phases of the program and by countries.

Considering the Hemisphere by geographic subregions (Graph 1), the whole of North America is in the maintenance phase. In middle America (Mexico, Central America, Panamá and the Caribbean islands) 48.2 per cent of the population is in the consolidation and maintenance phases and in South America, 59.7 per cent.

B. Current extent of the problem

During the year 1973, a total of 9,400,766 blood slides was examined, giving an annual blood examination rate (ABER) of 4.8 per cent. The total number of cases found was 280,144 with a slide positivity rate (SPR) of 2.98 per cent. Compared with the figures for 1972, there was a slight increase in the number of cases, by 2,232, as well as in the SPR by 0.11 per cent. Table 5 shows a summary of the number of blood slides examined and the number of malaria cases registered in the Americas from 1958 to 1973, while in Table 6 the same information is given for 1973 with details by countries and by program phases.

There was no change recorded in area in the maintenance phase as far as its extension is concerned. This area includes 20 political units (12 in total and eight partially) with 87,969,000 inhabitants. A Total of 4,037 malaria cases was found out of 1,031,489 blood slides examined. Of the 4,037 cases, 2,964 or 73.4 per cent were from Venezuela. Of 443 cases classified as autochthonous, 339 or 76.5 per cent were from Venezuela and 66 or 15.0 per cent from Argentina (Table 7).

There are 16 political units, which have areas in the consolidation phase with a total population of 45,535,000. A total of 1,961,152 blood slides was examined during the year, giving an ABER of 4.3 per cent. A total of 14,203 malaria cases was found, representing an annual parasite incidence (API) of 0.31 per 1,000 inhabitants. Of the 14,203 cases, 5,080 or 35.8 per cent were from Peru and 4,721 or 33.2 per cent from Colombia. Paraguay transferred an area with 1.158,000 inhabitants and Costa Rica an area with 220,000 inhabitants from the attack to the consolidation phase (Table 8).

The attack phase area extended to 19 political units with 61,915,000 inhabitants. A total of 6,118,810 blood slides was examined during the year, of which 257,573 were found to be positive for malaria, giving an ABER of 9.9 per cent and an API of 4.2 per 1,000 inhabitants (Table 9).

In the non-malarious area, 289,315 slides were examined, of which 4,331 were found to be positive for malaria. The majority of these cases were imported from areas in the attack phase within the country, but some were from areas in consolidation or from abroad (Table 10).

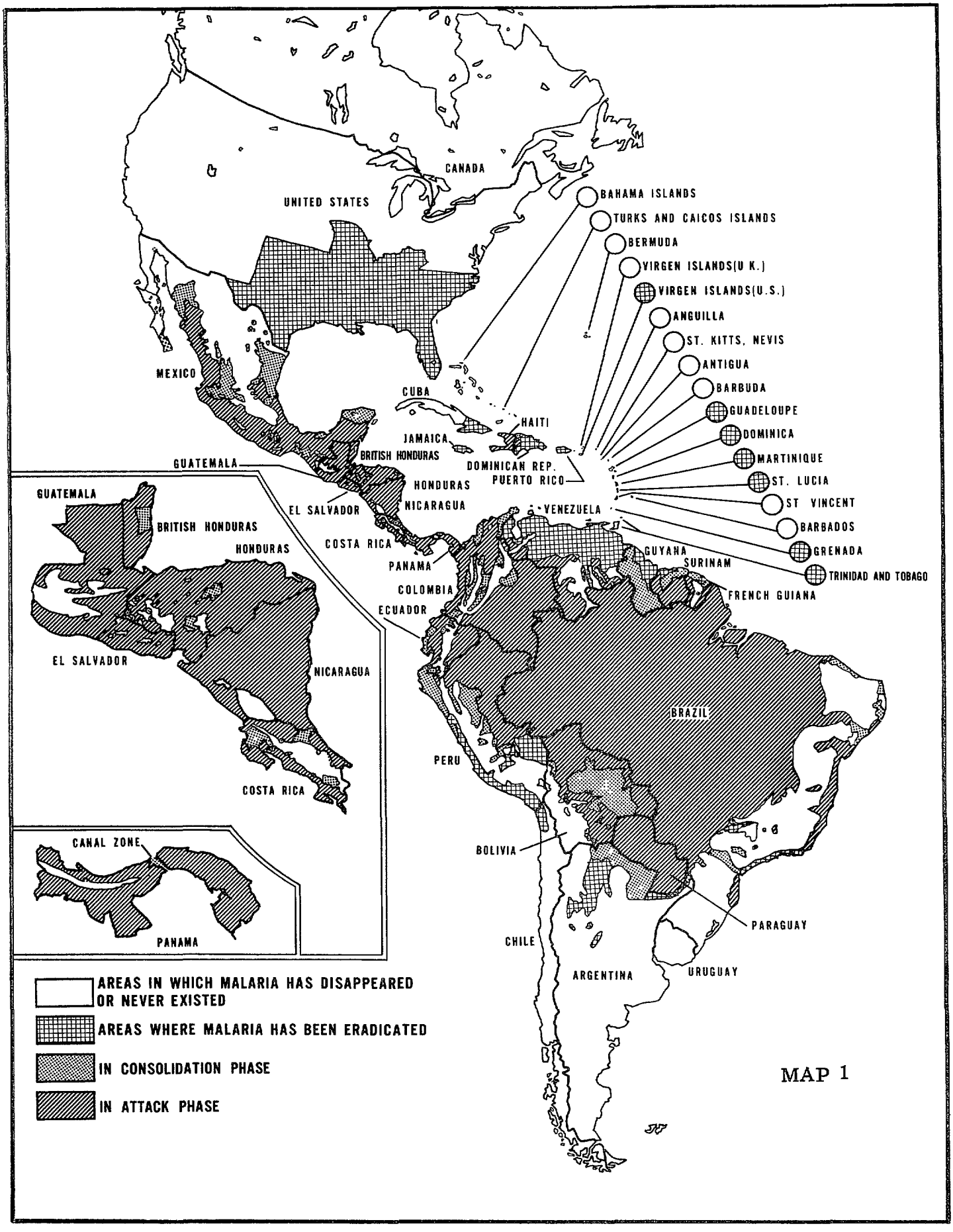
The malaria mortality registered for the period from 1969 to 1972 is shown in Table 11 by country. This information is obtained from the statistical office of the Ministries of Health, based on their routine reporting system. As can be seen, the information is not complete for every year; in some countries, no information is available. Not all of the deaths were certified by physicians and almost none of them confirmed by laboratory diagnosis.

Table 2

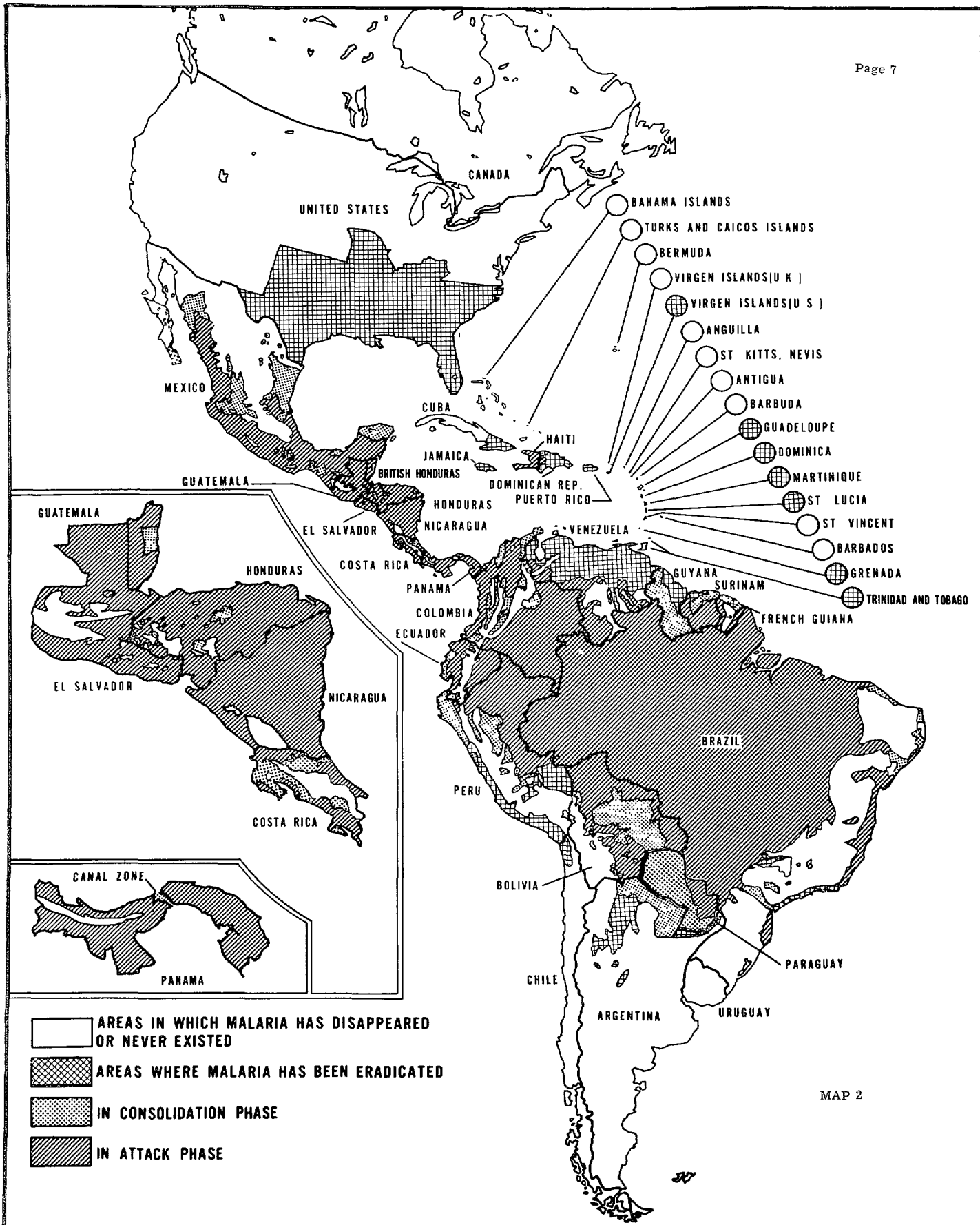
EVOLUTION OF MALARIA ERADICATION IN THE AMERICAS, BY PHASE 1958-1973

(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



STATUS OF THE MALARIA ERADICATION PROGRAM IN THE AMERICAS, 31 DECEMBER 1972



MAP 2

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

Table 3

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY POPULATION, 1973

(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	24 251[a]	3 006	12.4	1 887	62.8	1 119	37.2	-	-	-	-
Bahamas	193[a]	-	-	-	-	-	-	-	-	-	-
Barbados	241[a]	-	-	-	-	-	-	-	-	-	-
Bolivia	5 343	1 720	32.2	-	-	1 025	59.6	695	40.4	-	-
Brazil	102 927	41 489	40.3	4 388	10.6	14 388	34.7	22 713	54.7	-	-
Canada	22 121[a]	-	-	-	-	-	-	-	-	-	-
Chile	10 327	214	2.1	214	100.0	-	-	-	-	-	-
Colombia	23 209	13 647	58.8	-	-	9 292	68.1	4 246	31.1	109	0.8
Costa Rica	1 887	604	32.0	-	-	417	69.0	187	31.0	-	-
Cuba	8 916	3 115	34.9	3 115[b]	100.0	-	-	-	-	-	-
Dominican Republic	4 498	4 467	99.3	4 109	92.0	271	6.1	87	1.9	-	-
Ecuador	6 714	3 876	57.7	-	-	1 644	42.4	2 232	57.6	-	-
El Salvador	3 800	3 250	85.5	-	-	-	-	3 250	100.0	-	-
Grenada and Carriacou	98[c]	37	37.8	37[b]	100.0	-	-	-	-	-	-
Guatemala	5 212	2 152	41.3	-	-	-	-	2 152	100.0	-	-
Guyana	780	780	100.0	732	93.8	48	6.2	-	-	-	-
Haiti	5 103	3 760	73.7	-	-	-	-	3 760	100.0	-	-
Honduras	2 776	2 426	87.4	-	-	468	19.3	1 958	80.7	-	-
Jamaica	1 949[a]	1 559[d]	80.0	1 559[b]	100.0	-	-	-	-	-	-
Mexico	53 665	27 373	51.0	-	-	13 037	47.6	14 336	52.4	-	-
Nicaragua	2 073	2 073	100.0	-	-	-	-	2 073	100.0	-	-
Panama	1 570	1 510	96.2	-	-	-	-	1 510	100.0	-	-
Paraguay	2 389	1 991	83.3	-	-	1 158	58.2	833	41.8	-	-
Peru	14 889	5 190	34.9	1 421[b]	27.4	2 503	48.2	1 266	24.4	-	-
Trinidad and Tobago	1 048	828	79.0	828[b]	100.0	-	-	-	-	-	-
United States of America	209 851[a]	58 143	27.7	58 143[b]	100.0	-	-	-	-	-	-
Uruguay	2 991[a]	-	-	-	-	-	-	-	-	-	-
Venezuela	11 218	8 414	75.0	7 912[e]	94.0	-	-	502	6.0	-	-
Antigua	75[a]	-	-	-	-	-	-	-	-	-	-
Bermuda	58[a]	-	-	-	-	-	-	-	-	-	-
Belize	132	132	100.0	-	-	55	41.7	77	58.3	-	-
Canal Zone	48	48	100.0	-	-	48	100.0	-	-	-	-
Cayman Islands	11[a]	-	-	-	-	-	-	-	-	-	-
Dominica	70	14	20.0	14[b]	100.0	-	-	-	-	-	-
Falkland Islands	2[a]	-	-	-	-	-	-	-	-	-	-
French Guiana	50	50	100.0	25	50.0	19	38.0	6	12.0	-	-
Guadeloupe	350	306	87.4	306	100.0	-	-	-	-	-	-
Martinique	347[a]	216[d]	62.2	216	100.0	-	-	-	-	-	-
Montserrat	13[a]	-	-	-	-	-	-	-	-	-	-
Netherland Antilles	234[a]	-	-	-	-	-	-	-	-	-	-
Puerto Rico	2 923[a]	2 715[d]	92.9	2 715[b]	100.0	-	-	-	-	-	-
St. Kitts, Nevis, Anguilla	65[a]	-	-	-	-	-	-	-	-	-	-
St. Lucia	106	100	94.3	100[b]	100.0	-	-	-	-	-	-
St. Pierre and Miquelon	6[a]	-	-	-	-	-	-	-	-	-	-
St. Vincent	92[a]	-	-	-	-	-	-	-	-	-	-
Turks and Caicos Islands	6[a]	-	-	-	-	-	-	-	-	-	-
Surinam	405	259	64.0	184	71.0	43	16.6	32	12.4	-	-
Virgin Islands (U.K.)	13[a]	-	-	-	-	-	-	-	-	-	-
Virgin Islands (U.S.A.)	64	64	100.0	64[b]	100.0	-	-	-	-	-	-
Total	535 109	195 528	36.5	87 969	45.0	45 535	23.3	61 915	31.7	109	0.1

a) 1973 population figure, estimated by PAHO. b) Population in areas where eradication of malaria has been certified by PAHO/WHO. c) 1972 population figure provided by country. d) Estimated. e) Includes un area with 5,942,741 inhabitants where eradication of malaria has been certified by PAHO/WHO.

Table 4

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY AREA, 1973

(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	133 661	38.3	215 390	61.7	-	-	-	-
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[a]	81.0	82 402	1.2	179 025	2.6	6 636 464	96.2	-	-
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	834 387	85.9	23 286	2.4
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[b]	100.0	-	-	-	-	-	-
Dominican Republic	48 442	47 562	98.2	39 885	83.9	4 932	10.4	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[b]	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[b]	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	-	-	-	-	69 840	100.0	-	-
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[b]	100.0	-	-	-	-	-	-
United States	9 359 781	2 309 601	24.7	2 309 601[b]	100.0	-	-	-	-	-	-
Uruguay	186 926	-	-	-	-	-	-	-	-	-	-
Venezuela	912 050	600 000	65.8	460 054[c]	76.7	-	-	139 946	23.3	-	-
Antigua	280	-	-	-	-	-	-	-	-	-	-
Bermuda	53	-	-	-	-	-	-	-	-	-	-
Belize	22 965	22 965	100.0	-	-	4 307	18.8	18 658	81.2	-	-
Canal Zone	1 432	1 432	100.0	-	-	1 432	100.0	-	-	-	-
Cayman Islands	183	-	-	-	-	-	-	-	-	-	-
Dominica	751	152	20.0	152[b]	100.0	-	-	-	-	-	-
Falkland Islands	11 961	-	-	-	-	-	-	-	-	-	-
French Guiana	90 000	90 000	100.0	200	0.2	82 300	91.4	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[b]	100.0	-	-	-	-	-	-
St. Kitts, Nevis, Anguilla	396	-	-	-	-	-	-	-	-	-	-
St. Lucia	603	510	84.6	510[b]	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[b]	100.0	-	-	-	-	-	-
Total	40 384 403	15 745 459	39.0	3 389 715	21.5	2 202 109	14.0	10 130 349	64.3	23 286	0.1

a) Reduction of area resulted from reclassification of malarious areas. b) Area where eradication of malaria has been certified by PAHO/WHO. c) Includes an area with 407 945 Km^2 where eradication of malaria has been certified by PAHO/WHO.

GRAPH 1

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY REGION, 1973

POPULATION BY PHASE AS A PERCENTAGE OF ORIGINALLY MALARIOUS AREA

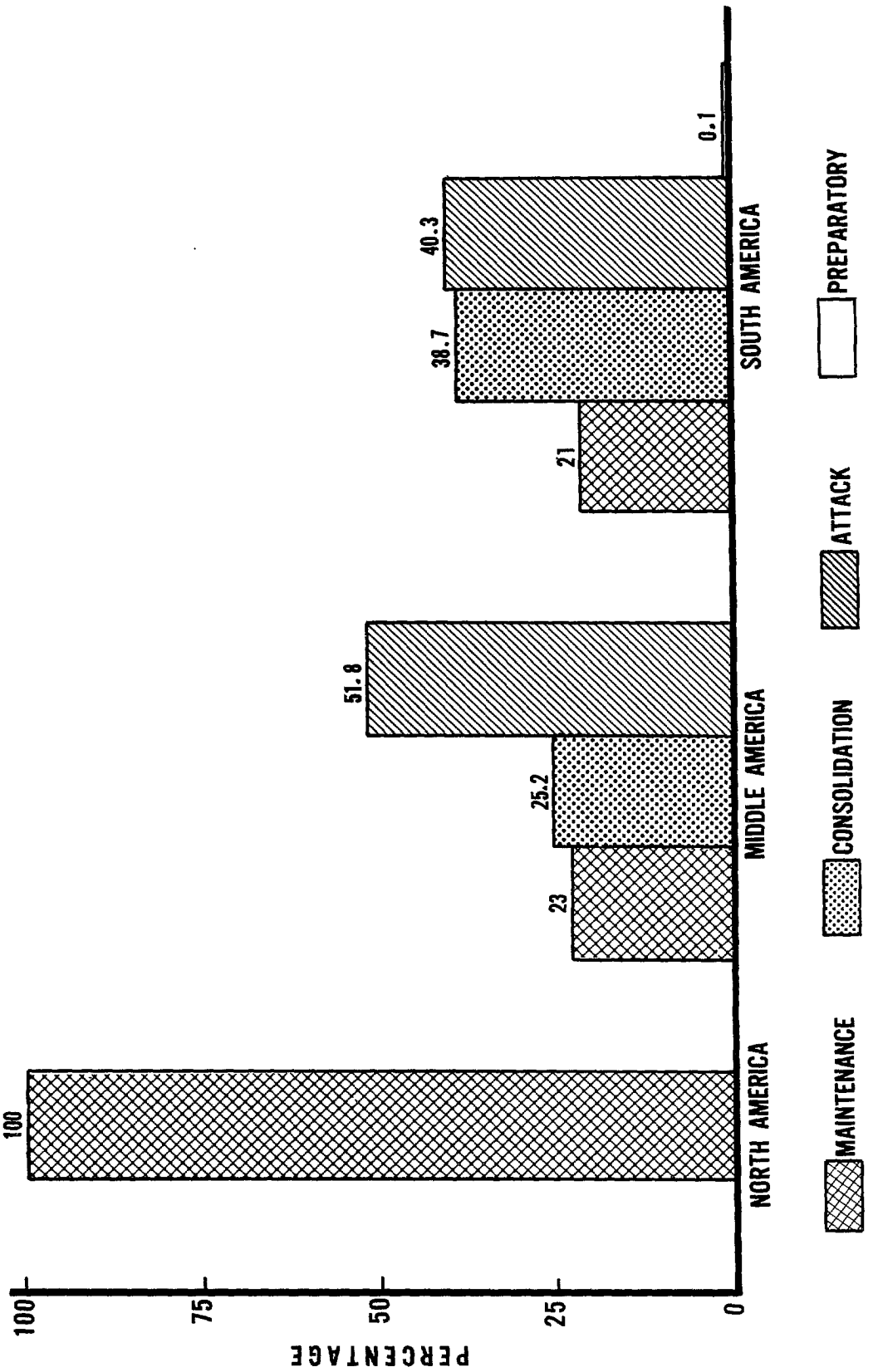


Table 5

SUMMARY OF CASE DETECTION IN THE AMERICAS, 1958-1973

Year	Number of slides examined	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

Table 6

CASE DETECTION BY COUNTRY AND PHASE OF PROGRAMA, 1973

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	92 241	805	51 478	230	40 612	575	-	-	151	-
Bolivia	118 417	7 696	-	-	22 788	545	95 497	7 105	132	46
Brazil	2 329 563	79 161	58 790	331	571 607	1 153	1 657 370	75 462	41 796	2 215
Colombia	631 563	56 494	-	-	287 763	4 721	340 294	51 398	3 506	375
Costa Rica	166 355	161	-	-	68 220	52	97 518	91	617	18
Cuba	542 215	8	364 228	0	-	-	-	-	177 987	8
Dominican Republic	374 880	569	294 065	151	38 473	1	42 309	417	33	0
Ecuador	374 151	6 810	-	-	134 035	708	240 116	6 102	-	-
El Salvador	393 110	35 095	-	-	-	-	368 090	34 573	25 020	522
Guatemala	386 026	6 182	-	-	-	-	380 440	5 876	5 586	306
Guyana	56 420	42	5 076	0	51 344	42	-	-	-	-
Haiti	309 482	22 858	-	-	-	-	309 482	22 858	-	-
Honduras	226 231	8 862	-	-	20 973	213	202 757	8 499	2 501	150
Jamaica	30 260	0	30 260	0	-	-	-	-	-	-
Mexico	1 959 139	23 176	-	-	464 394	773	1 468 614	22 251	26 131	152
Nicaragua	191 361	4 246	-	-	-	-	191 361	4 246	-	-
Panama	344 315	1 595	-	-	-	-	344 290	1 595	25	0
Paraguay	145 879	41	-	-	60 011	0	84 566	41	1 302	0
Peru	339 566	12 033	56 919	42	144 338	5 080	138 297	6 908	12	3
Trinidad and Tobago	16 468	2	16 468	2	-	-	-	-	-	-
United States [a]	211	211	211	211	-	-	-	-	-	-
Venezuela	245 817	11 555	139 571	2 964	-	-	104 491	8 112	1 755	479
Belize	24 414	99	-	-	2 332	1	22 082	98	-	-
Canal Zone	30 997	11	-	-	30 997	11	-	-	-	-
Dominica	11	0	11	0	-	-	-	-	-	-
French Guiana	9 739	484	1 800	98	5 010	294	2 929	92	-	-
Grenada and Carriacou	...	...	...	...	...	...	...	...	...	...
Guadeloupe	2 387	0	2 387	0	-	-	-	-	-	-
Puerto Rico	...	...	...	...	...	...	...	...	...	...
St. Lucia	100	0	100	0	-	-	-	-	-	-
Surinam	59 448	1 948	10 125	8	18 255	34	28 307	1 849	2 761	57
Total	9 400 766	280 144	1 031 489	4 037	1 961 152	14 203	6 118 810	257 573	289 315	4 331

a) Information up to October.

Table 7

EPIDEMIOLOGICAL EVALUATION IN AREAS UNDER MAINTENANCE PHASE IN MALARIA ERADICATION PROGRAMS, 1973

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 areas within country	Induced	Introduced	Cryptic and Unclassified	Not investigated
Argentina	51 478	230	-	230	-	-	66	10	7	16	1	63	5	62
Brazil	58 790	331	141	183	1	6	3	-	-	237	1	2	2	86
Cuba	364 228	0	-	-	-	-	-	-	-	-	-	-	-	
Dominican Republic	294 065	151	151	-	-	-	12	-	78	5	-	3	2	51
Grenada and Carriacou	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Guyana	5 076	0	-	-	-	-	-	-	-	-	-	-	-	
Jamaica	30 260	0	-	-	-	-	-	-	-	-	-	-	-	-
Peru	56 919	42	-	41	1	-	14	-	-	25[a]	-	1	-	2
Trinidad and Tobago	16 468	2	1	-	1	-	-	1	1	-		-	-	
United States of America[b]	211	211[c]	115	49	17	1	-	-	210	-	1	-	-	-
Venezuela	139 571	2 964	760	2 172	-	32	339	7	89	1 125	5	1 397	2	-
Dominica	11	0	-	-	-	-	-	-	-	-	-	-	-	-
French Guiana	1 800	98	97	1	-	-	9	-	2	64[d]	-	7	13	3
Guadeloupe	2 387	0	-	-	-	-	-	-	-	-	-	-	-	-
Puerto Rico	...	...	...	...	...	...	...	...	...	...	...	...	...	...
St. Lucia	100	0	-	-	-	-	-	-	-	-	-	-	-	-
Surinam	10 125	8	8	-	-	-	-	-	-	8	-	-	-	-
Total	1 031 489	4 037	1 273	2 676	20	39	443	18	387	1 480	8	1 473	24	204

a) Four cases imported from areas in Consolidation phase. b) Information up to October. c) Includes 12 P. ovale; 16 without species diagnosed and one case without information. d) 47 cases imported from areas in Consolidation phase.

Table 8

EPIDEMIOLOGICAL EVALUATION IN AREAS IN CONSOLIDATION PHASE IN MALARIA ERADICATION PROGRAMS, 1973

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	1 119	40 612	575	0.5	0.2	-	575	-	-	27	5	27	-	31	-	2	483
Bolivia	1 025	22 788	545	0.5	0.3	2	543	-	-	232	-	2	149	-	-	-	162
Brazil	14 388	571 607	1 153	0.1	0.03	345	800	-	8	296	3	-	502	8	5	5	334
Colombia	9 292	287 763	4 721	0.5	0.1	2 048	2 602	-	71	424	7	50	3 336	5	11	143	745
Costa Rica	417	68 220	52	0.1	0.1	4	48	-	-	34	-	12	5	-	-	-	1
Dominican Republi	271	38 473	1	0.0	-	1	-	-	-	-	-	1	-	-	-	-	-
Ecuador	1 644	134 035	708	0.4	0.3	240	468	-	-	334	6	-	135	1	9	4	219
Guyana	48	51 344	42	0.9	0.7	4	38	-	-	34	1	-	5	-	1	-	1
Honduras	468	20 973	213	0.5	0.2	7	204	2	-	24	2	1	30	-	-	-	156
Mexico	13 037	464 394	773	0.1	0.03	-	756	17	-	360	62	-	210	22	5	7	107
Paraguay	1 158	60 011	0	-		-	-	-	-		-	-	-	-	-	-	-
Peru	2 503	144 338	5 080	2.0	2.7	-	5 080	-	-	1 445	3	1	53	-	-	-	3 578
Belize	55	2 332	1	0.02	-	-	1	-	-	-	-	-	-	-		1	-
Canal Zone	48	30 997	11	0.2	0.04	9	2	-	-	2	1	8	-	-	-	-	-
French Guiana	19	5 010	294	15.5	14.4	294	-		-	152	1	2	1	-	8	4	126
Surinam	43	18 255	34	0.8	-	34	-		-	-	-	2	10	-	-	-	22
Total	45 535	1 961 152	14 203	0.3	0.2	2 988	11 117	19	79	3 364	91	106	4 436	67	39	166	5 934

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, 1973

Country or other political or administrative unit	Slides examined			Species found			
	Total	Positive		P. falciparum	P. vivax	P. malariae	Mixed infections
		Number	Porcentage				
Bolivia	95 497	7 105	7.4	628	6 468	-	9
Brazil	1 657 370	75 462	4.6	40 177	34 800	47	438
Colombia	340 294	51 398	15.1	31 844	19 036	4	514
Costa Rica	97 518	91	0.1	11	80	-	
Dominican Republic	42 309	417	1.0	417	-	-	-
Ecuador	240 116	6 102	2.5	755	5 328	-	19
El Salvador	368 090	34 573	9.4	7 026	27 358	-	189
Guatemala	380 440	5 876	1.5	3	5 873	-	-
Haiti	309 482	22 858	7.4	22 857	-	1	-
Honduras	202 757	8 499	4.2	220	8 270	-	9
Mexico	1 468 614	22 251	1.5	242	21 994	6	9
Nicaragua	191 361	4 246	2.2	251	3 989	6	-
Panama	344 290	1 595	0.5	644	944	-	7
Paraguay	84 566	41	0.05	1	39	-	1
Peru	138 297	6 908	5.0	1	6 883	24	-
Venezuela	104 491	8 112	7.8	2 162	5 904	3	43
Belize	22 082	98	0.4	-	98	-	-
French Guiana	2 929	92	3.1	86	6	-	-
Surinam	28 307	1 849	6.5	1 826	23	-	-
Total	6 118 810	257 573	4.2	109 151	147 093	91	1 238

Table 10

EPIDEMIOLOGICAL EVALUATION OPERATIONS IN NON-MALARIOUS AREAS, 1973

Country or other political or administrative unit	Slides examined			Species found			
	Total	Positive		P. falciparum	P. vivax	P. malariae	Mixed infections
		Number	Percentage				
Argentina	151	0	-	-	-	-	-
Bolivia	132	46	34.8	1	45	-	-
Brazil	41 796	2 215	5.3	866	1 324	4	21
Colombia	3 506	375	10.7	154	217	-	4
Costa Rica	617	18	2.9	1	15	-	2
Cuba	177 987	8	0	4	4	-	-
Dominican Republic	33	0	-	-	-	-	-
El Salvador	25 020	522	2.1	70	451	-	1
Guatemala	5 586	306	5.5	-	306	-	-
Honduras	2 501	150	6.0	-	150	-	-
Mexico	26 131	152	0.6	142	10	-	-
Panama	25	0	-	-	-	-	-
Paraguay	1 302	0	-	-	-	-	-
Peru	12	3	25.0	-	3	-	-
Venezuela	1 755	479	27.3	79	394	1	5
Surinam	2 761	57	2.1	56	-	-	1
Total	289 315	4 331	1.5	1 373	2 919	5	34

Table 11

REGISTERED DEATHS FROM MALARIA BY YEAR, 1968-1972

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	1969	1970	1971	1972	1969	1970	1971	1972
Argentina	0	1	...	...	-	0.00	...	...	-	0.0	...	...
Bolivia	...	...	...	...	...	...	...	...	...	...	...	...
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	...	0.60	0.45	0.48	...	4.5	2.9	3.2	...
Costa Rica	2	1	3	1	0.02	0.01	0.03	0.01	0.1	0.1	0.2	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	...	0.24	0.16	0.15	...	2.6	1.6	1.5	...
El Salvador	186	122	92	...	0.55	0.35	0.32	...	5.5	3.5	2.6	...
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	0.49	0.32	0.28	0.54	4.4	2.5	2.2	4.4
Jamaica	0	1	2	...	-	0.01	0.01	...	-	0.1	0.1	...
Mexico	35	33	38	43	0.01	0.01	0.01	0.01	0.1	0.1	0.1	0.1
Nicaragua	270	254	...	...	1.69	1.64	...	...	14.1	12.8	...	...
Panama	24	16	9	9	0.25	0.16	0.09	0.10	1.7	1.1	0.6	0.6
Paraguay	15	2	4	0	0.13	0.02	0.03	-	1.3	0.2	0.3	-
Peru	38	43	30	...	0.04	0.04	0.03	...	0.3	0.3	0.2	...
United States of America	11	5	6	...	0.00	0.00	0.00	...	0.0	0.0	0.0	...
Venezuela	4	8	15	17	0.01	0.01	0.02	0.02	0.0	0.1	0.1	0.2
Belize	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.

ARGENTINA

Since July 1972, all malarious areas in Argentina have been in consolidation and maintenance phases. However, during the year there was a certain deterioration in the malaria situation and reestablishment of malaria transmission in the Provinces of Salta and Jujuy, 751 cases having been detected up to September, the highest number since 1969. The foci of transmission were closely related to the importation of cases from the neighboring countries through a constant movement of the population along the border. Two meetings were held with neighboring countries, one in May with Bolivia and the other in October with Bolivia, Brazil and Paraguay to discuss the coordination of antimalarial activities in the frontier regions. Remedial measures are being applied and a favorable response is expected, once they are fully implemented.

BOLIVIA

The ME program continued to have financial and administrative problems in the execution of the 1973 plan. Although there was an increase of the ME budget by 30 per cent in 1973 in comparison with that of 1972, the untimely allocation of funds and rise in prices made it difficult to increase field activities. During the second spraying cycle, evaluators had to suspend their normal activities to reinforce the spraying squads in order to complete the coverage needed to control outbreaks. The malaria situation deteriorated considerably, especially in the Departments of Chuquisaca and Tarija. Besides the internal migration of laborers in these areas, there is a constant movement of population along the border with Argentina which makes it difficult to apply effective measures. Through the meetings with Argentinian authorities, a plan for coordination of antimalaria activities was agreed upon and is being implemented.

BRAZIL

Following reorganizations in the Federal Government, the Malaria Eradication Campaign (CEM) moved its Headquarters from Rio de Janeiro to Brasilia, the Capital City, where it operates under the Superintendency of Public Health Campaigns. The Government has given high priority to the malaria program in view of its importance to the country, especially in those areas where economic development is under way and where the Trans-Amazon and the Perimetrical Highways are under construction. The 1973 malaria budget was substantially increased and coverage with insecticide was extended to the Amazon Region where no regular antimalaria activities had ever been carried out previously. The Superintendency of Public Health Campaigns established as a goal for the current decade (1971-1980) the reduction of malaria transmission progressively towards an annual parasite incidence of 0.5 per 1,000 inhabitants by 1980, when malaria transmission would be limited to certain foci in the Amazon Region (1,081,000 inhabitants), but it would be interrupted in the rest of the country.

The malaria situation in general showed an improvement, although no change in the program phase has taken place during the year. The cities of Belem and Manaus, where high malaria incidence was recorded in the previous three years, showed a marked reduction in the number of cases by the intensification of antimalarial measures including larviciding in suburban areas. In areas in the maintenance phase, vigilance activities were carried out effectively.

COLOMBIA

The 1973 operating budget for the ME program was about 25 per cent less than what was needed for the planned program and consequently, the activities of epidemiological evaluation were reduced, although the spraying program was not altered. The malaria situation continued to be very serious in the Departments of Antioquia, Meta and Chocó due to a series of outbreaks caused by climatological conditions and progressive increases of refusals of DDT spraying, especially in the areas of colonization. The problem of P. falciparum resistance to chloroquine also increased in extension and intensity, making it difficult or impossible to use this drug as a therapeutic agent and/or as a complementary measure in mass drug administration. There was a general deterioration of the malaria situation in the country and the number of cases increased from 30,997 in 1972 to 56,494 in 1973.

COSTA RICA

The ME program was evaluated in May by a team composed of technical staff from the Government, PAHO/WHO and AID/USA. The team recommended the transfer of an area with 220,000 inhabitants from the attack to the consolidation phase, thus making a total of 417,000 inhabitants or 69 per cent of the total population of the malarious area in the latter phase of the program. The malaria situation continued to be favorable and except for some occasional foci originating from imported cases, there was no local transmission; 79 of a total of 161 cases registered in 1973 were classified as imported from the neighboring countries. For the better vigilance against importation of cases, all laborers who enter the country are issued an individual identification card by their employers, in which epidemiological information is recorded. The NMES is now in the process of providing support for the development of health services in rural areas and its laboratory facilities have been expanded to include activities in serological studies, using indirect fluorescent antibody (IFA) tests.

CUBA

In November, 1973, Cuba was entered in the WHO official Register of Areas where Malaria Eradication has been Achieved. Vigilance activities have been completely integrated into the general health services.

DOMINICAN REPUBLIC

The ME program has reached an advanced stage with 98.1 per cent of the population of the origianally malarious areas in the maintenance and consolidation phases. Most of the country is free of malaria transmission, despite the challenge imposed by imported cases. A few foci of transmission were registered in areas in the attack phase along the border with the neighboring country, but effective measures were taken to prevent the dispersion of sources of infection to other parts of the country where transmission has been interrupted. The NMES is actively supporting a project for the improvement of the general health services in rural areas. During the year, the NMES personnel was participating in health activities in Sanitary Regions I, II and III, which include 1,516,650 inhabitants or 63 per cent of the rural population in the country, in addition to maintaining malaria vigilance.

ECUADOR

The program, which had made a remarkable progress during 1969-1972, did not make further advances in 1973. Shortage of DDT obliged the NMES to spray only priority areas, resulting in inadequate coverage of the area still with transmission. In the first cycle (January-June), 250,997 houses were sprayed, representing 72.7 per cent of the total planned while in the second cycle only 138,853 houses were sprayed. In some parts of the country, malaria transmission was much reduced while in others it increased. The Provinces of Napo and Esmeraldas continued to be the areas with persistent transmission; in the former province shortage of fluvial transportation prevented penetration of the NMES personnel into the area, while in the latter new houses constructed at the rate of more than 10 per cent between spraying cycles and their precarious condition interfered with the proper protection of the inhabitants in the areas of colonization. The NMES has undertaken other responsibilities, which include the administration of antipolio vaccine, yellow fever vaccines, studies on the prevalence of yaws and promotion of maternal and child health and family planning programs in rural areas.

EL SALVADOR

Of the 3,250,000 inhabitants living in the malarious areas, only 523,000 were directly protected with antimalarial measures and the rest were without regular attack measures. DDT was in use where the vector is still suceptible to this insecticide, having protected directly a population of 20,490 during the year. Where the vector is resistant to DDT, propoxur was substituted. The population directly protected with this insecticide was 502,500. In the unprotected areas, the vector is still susceptible to DDT, but no regular attack measures were applied due to insufficient resources. Malaria incidence in the unprotected areas is generally low and emergency measures are applied when necessary. During the year, the malaria incidence in the country was maintained with these minimum measures, but due to the appearance of vector resistance to propoxur in some areas on the Pacific Coast where the malaria endemicity has been high, the situation showed a deteriorating trend towards the end of the year. Since the beginning of the year, the malaria program has been integrated into the general health services, and the duties of the malaria personnel have been expanded to cover other activities in vector control and immunization.

GUATEMALA

The entire malarious area is in the attack phase, with 2,152,000 inhabitants, of which 1,013,000 or 47.1 per cent were protected directly with antimalarial measures, 662,000 with DDT, 332,000 with propoxur and 19,000 with larvicides. In addition, on a limited scale (32,000 inhabitants) mass drug administration was carried out in the DDT area as a complementary measure. The rest of the population was left unprotected by regular attack measures, but malaria incidence among these inhabitants has been very low. There was a reduction of the number of malaria cases in the areas sprayed with DDT. Two outbreaks were observed in areas of agricultural colonization, sprayed with DDT. The situation was brought under control with emergency measures including change of insecticide. Considering the country as a whole, the number of cases decreased from 7,750 (SPR of 2.2 per cent) in 1972 to 6,182 (SPR of 1.6 per cent) in 1973. Only three cases of *P. falciparum* were identified throughout the year and two were classified as imported.

GUYANA

The malarious areas in Guyana are either in the maintenance or the consolidation phase. However, preventive measures were applied during the year in receptive and vulnerable areas. Semestrial spraying with DDT continued in the 20-mile strip (2,051 houses) along the southwestern frontier bordering Brazil and annual spraying (2,054 houses) in the interior of difficult access. Medicated salt was distributed among 1,700 balata bleeders and to 60 people in the New River area. Malaria surveillance continued with collaborators and active case detection. Except for a focus (Karasabai-Karabaicru) which gave 31 cases, no major problem was observed during the year. Of the 56,420 blood slides examined for the entire country, 42 were found positive, all being detected in the 20-mile strip along the Brazilian frontier. With the assistance of PAHO/WHO and USPHS/CDC, the program carried out a serological survey in 81 localities in the consolidation area. The results indicated the possibility of limited transmission foci which require further studies. The evaluators were given a three-week course in polyvalent health activities with the objective of establishing a basic health infraestructure in the interior; however, the plan has not been implemented.

HAITI

Since 1972, there has been no major change in the malaria situation. The application of antimalarial measures continued, using DDT spraying, larviciding and a limited amount of mass drug administration mainly to control the outbreaks in the southern peninsula. Larviciding operations were carried out as planned, but spraying and mass drug administration was rather irregular due to shortages of DDT and drugs. Entomological studies carried out during the period indicated that the effectiveness of DDT is decreasing in Haiti due to vector resistance in many localities.

The program is in the process of adopting a long-range integrated plan, which will include, besides malaria, the control or eradication of other communicable diseases.

HONDURAS

The originally malarious areas have a population of 2.4 million, 80.7 per cent of which live in the attack phase area. Due to budgetary restrictions, only 1,196,000 inhabitants were directly protected with antimalarial measures in 1973. Propoxur has been in use since 1971 in areas where the vector is resistant to DDT (204,500 inhabitants) and DDT in areas where this insecticide is still effective (991,500 inhabitants). In 1971, the propoxur area produced 37,020 cases of malaria or 76 per cent of the total detected in the country. With the application of propoxur, the number of cases and its proportion to the total was sharply reduced to 8,832 cases or 47 per cent in 1972 and further to 1,031 cases or 12 per cent in 1973. However, in the rest of the country--protected with DDT or without regular attack measures--the reduction was not very significant; 11,566 cases in 1971, 9,819 in 1972 and 7,831 in 1973. The northern valley "Valle de Sula" with 185,000 inhabitants, showed no change in the epidemiological situation during the last years, despite continued application of DDT. In this area, the walls of houses are constructed of canes, on which newspapers are pasted, especially in bedrooms, to prevent excessive ventilation during the cold months. It is the custom of the people to remove papers during the summer or to change papers frequently,thus removing the deposit of the insecticide. Considering the country as a whole, there was a marked reduction in the number of malaria cases, from 48,586 in 1971 to 18,651 in 1972 and further to 8,862 in 1973.

MEXICO

Of the 27 million inhabitants living in the malarious areas, 52.4 per cent were found in the attack phase area in 1973. The program continued to give its priority to areas along the Gulf of Mexico and Yucatán Peninsula, having obtained further reduction in the number of cases. In the rest of the country, the number of cases also decreased in general with the exception of the states of Michoacan, Jalisco, Sinaloa and Sonora where a slight increase was observed. To complement the effects of DDT spraying, larviciding with abate was applied around the city of Acapulco with excellent results. The plan to improve the construction of houses in rural areas was put in practice, especially in the areas with persistent transmission. A. pseudopunctipennis has developed various degrees of resistance to DDT along the Balsas River Basin and A. albimanus also appears to be resistant to DDT in the cotton growing area in the State of Chiapas. The Government increased the 1973 malaria budget by 20 per cent to cope with these problems.

NICARAGUA

During the first two months of the year, malaria field activities were much reduced because of the earthquake on December 23, 1972, which destroyed the Capital City of Managua and for which the NMES diverted its efforts to emergency activities. Antimalarial operations were subsequently resumed and despite a series of difficulties associated with earthquake damage the program managed to keep the epidemiological situation under good control. During the year, the number of malaria cases and SPR were further reduced from 9,595 cases and 4.6 per cent in 1972 to 4,246 cases and 2.2 per cent in 1973.

PANAMA

The program was evaluated in November by a team of national and PAHO staff who commented very favorably about the progress of the program. The team recommended transfer of an area of 16,000 km^2 with a population of 410,000 (27.3 per cent of the population of the malarious area) from the attack to the consolidation phase. Transmission has been focalized to the Provinces of Bocas de Toro and Darien. However, in the Comarca de San Blas, which had had virtually no malaria since 1962, a malaria outbreak took place in July 1973, having produced 716 malaria cases as of 31 December 1973, which represented 45 per cent of the total cases found in the country.

PARAGUAY

Paraguay has made a dramatic success in malaria eradication since the reinitiation of the current program in 1967 when the number of confirmed cases reached 50,304. Malaria transmission has been interrupted and the number of cases has decreased sharply every year. In 1973, only 41 cases were registered and none of them was authochthonous. During the year, an area with 1,158,000 inhabitants or 58.2 per cent of the population in the malarious area was transferred from the attack to the consolidation phase. The rest of the country, with 41.8 per cent of the population of the malarious area remains in the attack phase pending further evaluation.

PERU

Of 5,190,000 inhabitants in the malarious areas, 27.4 per cent are in the maintenance phase, 48.2 per cent in consolidation and only 24.4 per cent in the attack phase. However, since 1969 the program has shown a certain deterioration in its epidemiological situation, especially in the consolidation and attack phase areas. Due to shortage of financial resources and insecticides and the appearance of new foci of transmission in the consolidation phase areas, major efforts had to be diverted to the execution of emergency measures, leaving the attack phase areas without regular application as planned for the year. As a result, malaria transmission increased in the attack phase area, especially in the Amazon Basin and some valleys of the Andean Region, resulting in the dispersion of sources of infection and generating more foci in the consolidation phase areas. The number of malaria cases detected in the country reached 12,033 with a SPR of 3.5 per cent, the highest since the initiation of the program.

VENEZUELA

The population in the malarious area totals 8,414,000, of which 7,912,000 (94.0 per cent) were in the maintenance phase and 502,000 in the attack phase. Persistent malaria transmission continued in 25 municipalities in the states of Apure, Barinas, Mérida, Táchira and Zulia. The attack measures applied during the year included DDT house spraying, distribution of Chloroquine reserves to each individual family, radical cure treatment of all P. falciparum infection, peridomiciliary insecticide fogging and mass drug administration every week in the localities with an API of more than 100 per 1,000 inhabitants. The number of malaria cases found in the country in 1973 was 11,555 out of 245,817 blood slides examined (SPR 4.7 per cent). In 1972, the number of cases was 18.062 with a SPR of 6.9 per cent.

BELIZE

Of the 132,000 inhabitants in the country, all in the malarious area, 55,000 live in the consolidation phase area and 77,000 in the attack phase area. Belize has had increasingly activities, both turistic and agricultural, with a constant interchange of people with the Central American countries, especially with Guatemala and El Salvador. The transitory farm laborers coming and going at undetermined intervals have been the main sources of infection, which maintains a low transmission in the attack phase area. The NMES has conducted an efficient program in eliminating the foci when they appear, but the efforts will have to be continued as long as such risk exists. During 1973 a total of 99 cases was found, 98 being detected in the attack phase area and one in the consolidation area.

FRENCH GUIANA

Compared with the previous year, antimalarial activities were intensified both in the attack and consolidation phase areas, in view of the increase in malaria cases and of the spread of sources of infection along the coast. The malaria situation along the Oyapock River, which borders Brazil, remained favorable, but that on the Maroni River bordering Surinam deteriorated considerably since May 1973. DDT house spraying and drug treatment were carried out in the interior as well as in the affected localities on the coast. The number of malaria cases detected in 1973 was 484 in comparison with 192 in 1972.

SURINAM

The malaria situation in the country showed deterioration in 1973 with an increase of the number of malaria cases in the attack phase area. In March, an outbreak was observed along the Tapanahony River which had been under medicated salt coverage. Of the 16 P. falciparum cases found in the affected area, six were identified as R-1 resistant to Chloroquine. Distribution of chloroquinized salt was discontinued in September, 1973. The localities affected were sprayed with dieldrin in May, but the coverage was only 37.3 per cent. Those infections which did not respond to Chloroquine with the three-day treatment, received Sulphadoxine and Perymethamine. During the year, 59,448 blood slides were examined and 1,948 cases identified, while in 1972 the figures were 59,600 blood slides with 800 cases.

C. Field Operations

As in previous years, the application of residual sprayings to houses continued as the method of choice for attacking malaria. In 1973, house sprayings totaled 16,791,930, as compared to 17,705,420 in 1972. The decrease resulted in part from a conversion of areas from attack to consolidation in some countries and from a shortage of insecticides and financial resources in others. DDT was applied to about 95 per cent of the houses. Propoxur continued to be used in areas of vector resistance to DDT and dieldrin in Central America and a mixture of HCH and DDT was utilized in spraying a limited number of houses by Mexico and Colombia for supplementary control of household pests. Alternative or supplementary attack measures employed during the year consisted of presumptive chemotherapy in all programs; distribution of medicated salt in French Guiana and Surinam (up to September 1973); larviciding of foci in the Dominican Republic, Guatemala, Haiti, Mexico and Nicaragua and mass drug distribution in limited areas of Colombia, Guatemala, Haiti, Peru and French Guiana (Table 24).

Despite the continued assignment of a high priority by National Governments to the eradication effort, the scope of operations and/or their potential effectiveness was adversely affected during the year by factors beyond the control of the malaria campaigns. For example, inflation throughout the Hemisphere and the energy crisis resulted in significant increases in costs of supplies and equipment which prevented purchase of planned quantities of insecticides or replacement parts for vehicles and sprayers. Thus operations were adversely affected by logistical problems and, in some countries, also by increasing areas of vector resistance. Despite such problems, however, the 280,144 cases of malaria detected in 1973 exceeded those of 1972 by only 2,232.

Tables 12 to 19 summarize by program, data on houses sprayed, insecticides used, type and condition of vehicles and the number of persons employed by professional category or activity. As noted above, decreased operations in 1973 resulted from a combination of factors, including withdrawal of assistance by UNICEF. Nevertheless, increased National appropriations for malaria and the flexibility demonstrated by most of the programs in solving logistical problems of supplies and equipment during the year gives some hope for the future.

The collection and examination of blood slides was continued, through passive and active case detection systems. In addition, under exceptional circumstances or for special epidemiological studies, mass surveys were made. During the year, a total of 5,486,479 blood slides was collected through active and 3,914,287 through passive case detection systems. From the former system including surveys, 89,874 cases (SPR 1.6 per cent) were found and from the latter 190.270 cases (SPR 4.9 per cent). Table 20 shows the results of both active and passive case detection.

Table 12

HOUSES SPRAYED WITH RESIDUAL INSECTICIDES,[a] BY COUNTRY AND BY CYCLE, 1973

County 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]	-	14 152	-	-	17 355	-	-	-	-	-	-	-	31 507
Bolivia	44 835	45 879	102.3	43 184	39 358	91.1	-	-	-	-	-	-	85 237
Brazil	3 883 557	3 500 955	90.1	3 681 784	3 164 062	85.9	-	-	-	-	-	-	6 665 017
Colombia (Semestrial)	309 949	261 056	84.2	309 744	257 436	83.1	-	-	-	-	-	-	518 492
(Annual cycle)	141 200	125 979	89.2	-	-	-	-	-	-	-	-	-	125 979
(Emergency cycles)	...	59 256	-	...	50 397	-	-	-	-	-	-	-	109 653
Costa Rica (Semestrial)	38 171	31 460	82.4	38 376	31 995	83.4	-	-	-	-	-	-	63 455
(Quarterly, propoxur)	-	-	-	3 348	3 611	107.9	3 795	3 607	95.0	3 790	3 664	96.7	10 882
Dominican Republic	6 066	5 599	92.3	6 205	5 163	83.2	-	-	-		-	-	10 762
Ecuador (Semestrial)	348 020	250 997	72.1	188 708	138 853	73.6	-	-	-	-	-	-	389 850
(Annual cycle)	173 981	74 843	43.1	-	-	-	-	-	-	-	-	-	74 843
El Salvador (Semestrial)	4 283	3 660	85.5	4 283	3 130	73.1	-	-	-	-	-	-	6 790
(Quarterly, propoxur)	66 292	61 921	93.4	66 292	63 439	95.7	66 292	63 485	95.8	66 292	62 392	94.1	675 724[c]
Guatemala (Semestrial)	125 338	121 063	96.6	131 891	126 722	96.1	-			-	-	-	247 785
(Quarterly cycles)	17 701	16 179	91.4	17 814	16 128	90.5	3 793	3 690	97.3	3 865	3 742	96.8	39 739
(Quarterly, propoxur)	86 915	82 368	94.8	90 338	84 590	93.6	103 748	96 100	92.6	102 983	96 730	93.9	359 788
Guyana	2 051	1 426	69.5	2 051	1 675	81.7	-	-	-	-	-	-	9 343[d]
Haiti (Semestrial)	-	-	-	570 873	592 365	103.8	-	-	-	-	-	-	592 365
(Quarterly cycles)	69 822	68 868	98.6	-	-	-	69 144	68 271	98.7	69 144	71 743	103.8	208 882
Honduras (Semestrial[e])	107 878	109 329	101.3	111 335	110 710	99.4	-	-	-	-	-	-	220 039
(Annual cycle)	52 872	47 105	89.1	-	-	-	-	-	-	-	-	-	47 105
(Quarterly, propoxur)	35 586	34 127	95.9	35 601	34 715	97.5	36 317	34 880	96.0	36 738	34 734	94.5	138 456[f]
Mexico (Semestrial, attack)	2 233 960	2 222 645	99.5	1 686 731	2 221 903	131.7	-	-	-	-	-	-	4 444 548
(Semestrial, consolidation)	102 909	104 445	101.5	75 899	100 394	132.3	-	-	-	-	-	-	204 839
(4-Months cycles)	62 062	61 742	99.5	62 646	62 502	99.8	40 489	62 523	154.4	-	-		186 767
Nicaragua (Semestrial)	12 576	8 329	66.2	10 703	8 300	77.5	-	-	-	-	-	-	16 629
(Quarterly, propoxur)	46 898	35 168	75.0	103 914	98 209	94.5	106 923	99 213	92.8	108 543	99 403	91.6	331 993
Panama (Semestrial)	91 164	77 482	85.0	94 159	83 151	88.3	-	-	-	-	-	-	160 633
(Annual cycle, DDT)	9 197	9 066	98.6	-	-	-	-	-	-	-	-	-	9 066
(Quarterly, DDT)	7 972	7 365	92.4	6 997	6 595	94.3	6 277	5 964	90.7	5 318	4 878	91.7	24 802
(Quarterly, propoxur)	1 309	1 908	145.8	3 042	2 766	90.9	3 175	2 634	83.0	5 778	5 154	89.2	12 462
Paraguay (Semestrial)	145 124[g]	148 398	102.3	75 522[h]	79 703[h]	105.5	-	-	-	-	-	-	228 101
(4-Months cycles)	1 234	1 279	103.6	1 305	1 328	101.8	1 373	1 067	77.7	-	-	-	3 674
Peru	198 087	136 751	69.0	183 856	148 855	81.0	-	-	-	-	-	-	285 606
Venezuela (Semestrial)	121 873	109 985	90.2	125 982	121 024	96.1	-	-	-	-	-	-	231 009
(4-Months cycles)	22 445	26 487	118.0	27 817	27 508	98.9	22 759	23 225	102.0	-	-	-	77 220
(Quarterly cycles)	17 277	16 166	93.6	17 418	20 585	118.2	20 248	22 856	112.9	20 097	22 986	114.4	82 593
Belize	11 364	11 761	103.5	12 701	11 319	89.1	-	-	-	-		-	23 080
French Guiana	15 800	14 650	92.7	-	-	-	-	-	-	-	-	-	14 650
Surinam	1 771	563	31.8	3 594	2 002	55.7	-	-	-	-	-	-	2 565
Total	8 617 539	7 910 412	91.8	7 794 113	7 737 848	99.3	484 333	487 515	100.7	422 548	405 426	95.9	16 971 930

a) DDT sprayings unless otherwise indicated. b) Emergency sprayings. c) Includes 381 314 houses partially sprayed with Propoxur in 10 cycles carried through by the SNEM, and 43 173 houses in 9 cycles carried through by AMRO-0216. (Partially sprayed with Propoxur). d) Includes 4 191 houses sprayed once a year and 2 051 houses sprayed in Maint. phase areas. e) Includes semestrial sprayings in Valle de Sula. f) In addition, 126 844 houses were sprayed with Propoxur in Marcovia. g) Cycle from Oct. 1972 to April 1973. h) Cycle from May to Nov. 1973.

Table 13

INSECTICIDES USED IN THE MALARIA ERADICATION PROGRAMS

Country of other political or administrative unit	DDT (kg.)				Propoxur (kg.)		Other	
	1973		1974 (Est.)		1973	1974 (Est.)	1973	1974 (Est.)
	100%	75%	100%	75%				
Argentina	684	19 011	1 000	20 000	-	-	-	-
Bolivia	187	62 364	500	97 470	-	-	-	-
Brazil	157 596	2 534 348	328 522	4 187 897	-	-	-	-
Colombia	2 053	423 499	3 500	596 790	-	-	6 677[a]	7 500[a]
Costa Rica	4 100	48 600	4 445	32 598	48 000[b]	4 969	-	-
Dominican Republic	2 123	9 547	3 000	10 000	-	-	-	-
Ecuador	2 006	355 543	...	409 841	-	-	-	-
El Salvador	5 390	9 084	3 536	9 771	232 264	253 861	-	-
Guatemala	67 044	78 589	70 135	68 066	88 184	102 376	-	-
Guyana	-	1 849	-	2 650	-	-	-	-
Haiti	...	...	...	...	...	...	...	...
Honduras	2 178	126 407	3 500	170 000	72 789	88 000	-	-
Mexico	63 733	3 002 317	61 951	2 871 066	-	-	11 888[c]	-
Nicaragua	639	6 635	2 000	18 000	116 393	183 000	-	-
Panama	14 730	100 624	12 700	97 650	5 428	11 500	-	-
Paraguay	-	117 990	-	121 057	-	-	-	-
Peru	-	293 372	-	302 777	-	-	-	-
Venezuela	38 815	200 715	8 100	277 700	-	-	28 063[d]	75 450[e]
Belize	2 246	11 090	3 077	9 229	-	-	-	-
French Guiana	700	14 000	...	20 000	-	-	6 660[f]	2 500[g]
Surinam	114	-	-	-	-		643[h]	10 000[h]

a) Kg. BHC. b) Amount in liters. c) Kg. HCH, 25%. d) Includes 23 875 Lts. of DATCE (30%) and 4 188 Lts. of BAYTEX (95%). e) Includes 58 200 Lts. of DATCE (30%) and 17 250 Lts. of BAYTEX (95%). f) Includes 6 160 Lts. of malathion and 500 Lts. of Abate emulsion. g) Includes 2 000 Lts. of malathion and 500 Lts. of Abate emulsion. h) Kg. of Dieldrin 50%.

Table 14

MEANS OF TRANSPORT IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1973

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	2	1	41	29	45	10	5	1	-	-	-	-	3	-	1	-	5	-[c]	-[c]
Bolivia	-	-	7	7	13	24	2	-	-	20	-	-	15	10	-	-	70	16[c]	35[c]
Brazil	17	19	178	97	461	263	10	-	6	-	218	326	221	145	-	-	1 462	7[d]	-
Colombia	13	3	65	62	152	25	40	9	15	5	185	36	220	5	39	-	1 279	246	68
Costa Rica	1	-	9	-	10	-	-	-	40[e]	6	28	30	14	-	-	-	46	-	-
Dominican Republic	1	-	52	-	2	-	6	-	129[e]	-	-	-	-	-	-	-	73	-	-
Ecuador	2	1	35	8	28	19	6	2	14	24	26	4	14	7	25	5	378	1	-
El Salvador	1	-	21	1	6	17	1	-	-	20	-	-	7	-	1	-	-	-	-
Guatemala	-	2	-	51	-	34	-	6	-	92	-	100	-	14	-	-	66	-	9
Guyana	-	-	-	-	5	3	-	-	-	-	2	-	-	6	2	5	5	-	-
Haiti	5	1	58	17	47	17	14	3	-	-	-	-	1	-	-	-	-	-	-
Honduras	2	2	28	5	25	1	9	-	29	42	-	-	-	-	-	-	87	-	-
Jamaica	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-
Mexico	22	13	173	336	451	312	11	10	-	-	-	-	43	9	-	-	2 404	-	-
Nicaragua	-	2	1	23	1	19	3	7	-	15	18	-	-	-	-	-	-	-	1
Panama	2	1	10	36	9	21	4	4	7	40	20	4	32	14	-	-	-	-	-
Paraguay	2	2	36	42	17	3	14	-	165	20	50	-	21	-	-	-	-	32[c]	9[c]
Peru	2	-	44	4	12	7u	34	23	5	-	-	-	121	62	84	20	-	24	7
Trinidad and Tobago	3	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	6	-	142	-	116	-	37	-	18	-	339	-	133	-	-	-	700	86[f]	-
Belize	-	-	4	1	6	1	-	1	-	-	-	1	4	2	-	-	-	-	-
Canal Zone	-	-	2[g]	-	-	-	-	-	-	-	-	-	2[g]	-	2[g]	-	-	-	-
French Guiana	1	-	-	-	3	3	3	1	-	-	-	-	3	-	-	-	-	5[c]	4[c]
Surinam	-	-	3	-	-	1	3	2	4	3	-	-	14	9	-	-	-	-	-
Total	82	47	909	719	1 419	795	202	69	432	287	886	501	868	283	154	30	6 575	417	133

a) In good conditions. b) In bad conditions. c) Out-board motors. d) Cranes. e) Property of the users. f) Fogging machines and equipment for ULV.
g) Part-time.

Table 15

PERSONNEL EMPLOYED IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS
31 DECEMBER 1972 AND 1973, BY CATEGORY

(Part-time personnel in parentheses)

	Title	1972	1973
SPRAYING OPERATIONS	Engineers	111 (1)	107 (1)
	Spraying Chiefs	307 (2)	304 (2)
	Sector Chiefs	716	647
	Squad Chiefs	3 008 (32)	2 861 (32)
	Spraymen	12 757 (108)	11 942 (112)
	Draftsmen	111	125
	SUB-TOTAL	17 010 (143)[a]	15 986 (147)[a]
EPIDEMIOLOGICAL EVALUATION	Physicians	224 (4)	215 (2)
	Entomologists	56 (1)	58 (1)
	Assistant Entomologists	185 (5)	195 (6)
	Statisticians and Statisticians' Assistants	420	377
	Evaluation Inspectors	1 520 (155)[b]	1 188
	Evaluators	6 315[b]	6 668
	Microscopists	862 (12)	852 (12)
	SUB-TOTAL	9 582 (177)	9 553 (21)
ADMINISTRATION AND OTHERS	Administrators	91	63
	Administrative Assistants	770	817
	Accountants	48	48
	Disbursing Officers	58	56
	Storekeepers	96	96
	Storekeepers' Assistants	83	99
	Secretaries	237	231
	Others	930	549
	SUB-TOTAL	2 313	1 959
TRANSPORT	Transport Chiefs, Mechanics and Assistant Mechanics	707	536
	Drivers	1 333 (2)	1 117 (2)
	Motorboat Operators	360 (2)	379 (2)
	Boatmen	43	66
	SUB-TOTAL	2 443 (4)	2 098 (4)
	GRAND-TOTAL	31 348 (324)	29 596 (172)

a) In some programs this personnel performs epidemiological activities.
b) Includes personnel with same category from the mass drug distribution program.

Table 16

PERSONNEL EMPLOYED IN SPRAYING OPERATIONS IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1973

(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	62	2	7	5	12	36	-
Bolivia	49 (124)	-	7	24	1 (32)	16 (92)	1
Brazil	6707	31[a]	78	4	1015	5556	23
Colombia	768	10	23	47	196	478	14
Costa Rica	80	-	3	9	12	55	1
Dominican Republic	15	1	2	-	3	8	1
Ecuador	678	3	8	48	116	500[b]	3
El Salvador	250	1	5	9	42	191[b]	2
Guatemala	448	1	1	33	73	336[b]	4
Guyana	10	-	1	-	1	8	-
Haiti	774	2	3	66	115	581	7
Honduras	236	-	1	8	40	187	-
Mexico	4 256	48	118	244	974[c]	2823	49
Nicaragua	248	1	10	21[e]	39	176[b]	1
Panama	294	-	2	27	43	220	2
Paraguay	157	1	9[e]	21	24	97	5
Peru	305	2	23	32	44	198	6
Trinidad and Tobago	83	-	1	1	2	76[b]	3
Venezuela	453	4	-	35	90	322	2
Belize	20	-	1	1	3	15	-
Canal Zone	(23)	(1)	(2)	-	-	(20)[b]	-
French Guiana	69	-	-	3	16	50	-
Surinam	24	-	1	9	-	13	1
Total	15 986 (147)	107 (1)	304 (2)	647	2 861 (32)	11 942 (112)	125

a) Includes 5 architects, 8 agronomists, 8 pharmacists and 1 veterinarian. b) Includes personnel from the larviciding program. c) Includes 285 squad aids and 8 instructors. d) Are also medicated salt plant workers. e) Performing epidemiological evaluation activities also.

Table 17

PERSONNEL EMPLOYED IN EPIDEMIOLOGICAL EVALUATION OPERATIONS IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1973

(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	224	3	1	2	2	28	166	22
Bolivia	126	8	-	3	7	6	88	14
Brazil	4 086	39[a]	13	38	221	792	2 710[c]	273
Colombia	995	16	2	3	3	157	775[c]	39
Costa Rica	135	1	2	2	-	14	104	12
Dominican Republic	236	2	1	3	4	26	165[c]	35
Ecuador	189	11	2	8	4	-	131[c]	33
El Salvador	166	5	1	12	6	21	90[c]	31
Guatemala	192	2	1	9	9	1	141[c]	29
Guyana	61	1	-	-	12	6	39[c]	3
Haiti	313	11	2	15	14	10	220[c]	41
Honduras	99	1	1	9	7	9	48	24
Jamaica	50	13	-	30	1	-	-	6
Mexico	1 145	67	16	16	17	31	857	141
Nicaragua	159	4	1	10	12	-	110	22
Panama	210	2	1	5	9	5	167	21
Paraguay	204	5	2	8	13	-	162	14
Peru	289	8	7	-	25	-	217	32
Trinidad and Tobago	95	2	1	4	1	1	78	8
Venezuela	508	12	2	16	9	71	356	42
Belize	16 (4)	(1)	-	(3)	-	1	13	2
Canal Zone	(17)	(1)	(1)	(3)	-	-	-[c]	(12)
French Guiana	15	1	2	2	-	4	4	2
Surinam	40	1	-	-	1	5	27	6
Total	9 553 (21)	215 (2)	58 (1)	195 (6)	377	1 188	6 668	852 (12)

a) Includes 6 pharmacists and 1 biologist. b) Also performing activities in spraying operations. c) Includes personnel with same category from mass drug distribution activities.

Table 18

PERSONNEL EMPLOYED IN ADMINISTRATIVE AND OTHER SERVICES IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS - 31 DECEMBER 1973

(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	137	2	38	-	-	7	5	-	85
Bolivia	31	6	-	2	1	1	2	9	10
Brazil	158	10	105	2	9	9	4	-	19
Colombia	178	1	22	1	18	18	4	108	6
Costa Rica	58	1	-	3	-	1	3	2	48
Dominican Republic	42	1	4	1	-	1	2	2	31
Ecuador	83	6	2	8	7	8	-	24	28
El Salvador	31	1	3	3	1	1	1	5	16
Guatemala	63	1	6	6	3	1	11	12	23
Guyana	18	-	-	-	-	2	-	1	15
Haiti	28	3	3	2	1	6	3	10	-
Honduras	51	2	6	1	-	2	1	5	34
Jamaica	15	1	8	-	-	2	2	2	-
Mexico	682	15	484	3	15	17	30	5	113
Nicaragua	51	5	10	1	-	7	3	7	18
Panama	65	2	17	3	-	2	2	9	25
Paraguay	97	1	64	1	1	3	8	11	8
Peru	98	3	40	5	-	5	12	15	18
Trinidad and Tobago	40	1	1	1	-	2	2	1	32
Venezuela	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Belize	4	-	-	-	-	-	-	2	2
Surinam	29	1	4	-	-	1	4	1	18
Total	1959	63	817	48	56	96	99	231	549

a) Services performed by the "Dirección de Malariología 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 1973

(Part-time personnel in parentheses)

Country or other political or administrative unit	Total	Transport Chiefs, mechanics and assistant mechanics	Drivers	Motorboat operators	Boatmen
Argentina	58	22	33	3	-
Bolivia	40	9	25	6	-
Brazil	698	19	582	97	-
Colombia	351	115	72	156	8
Costa Rica	20	9	11	-	-
Dominican Republic	31	15	16	-	-
Ecuador	118	11	81	14	12
El Salvador	62	22	40	-	-
Guatemala	51	13	36	2	-
Guyana	21	2	7	7	5
Haiti	54	30	22	1	1
Honduras	38	14	22	2	-
Jamaica	9	4	5	-	-
Mexico	243	174	34	35	-
Nicaragua	59	11	38	10	-
Panama	18	12	4	1	1
Paraguay	60	18	37	-	5
Peru	55	19	19	17	-
Trinidad and Tobago	15	-	15	-	-
Venezuela	(a)	(a)	(a)	(a)	(a)
Belize	2	2	-	-	-
Canal Zone	(4)	-	(2)	(2)	-
French Guiana	26	2	11	3	10
Surinam	69	13	7	25	24
Total	2 098 (4)	536	1 117 (2)	379 (2)	66

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

Table 20

COMPARATIVE RESULTS OF ACTIVE AND PASSIVE CASE DETECTION IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1973

Country or other political or administrative unit	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	Per cent			Examined	Positive	Per cent		Examined	Positive
Argentina	153	36 063	429	1.2	752	752	56 178	376	0.7	17.8	92 241	805
Bolivia	92	95 096	3 511	3.7	2 744	354	23 321	4 185	17.9	5.5	118 417	7 696
Brazil	3 474	1 681 132	28 419	1.7	25 179	10 173	648 431	50 742	7.8	5.3	2 329 563	79 161
Colombia	805	403 337	26 462	6.6	9 859	4 690	228 226	30 032	13.2	4.1	631 563	56 494
Costa Rica	121	162 815	99	0.1	1 486	129	3 540	62	1.8	2.3	166 355	161
Cuba	...	61 128	0	-	...	...	481 087	8	0.0	-	542 215	8
Dominican Republic	154	63 334	399	0.6	4 831	1 697	311 546	170	0.1	15.3	374 880	569
Ecuador	104	168 632	764	0.5	5 364	2 719	205 519	6 046	2.9	6.3	374 151	6 810
El Salvador	89	53 380	1 735	3.3	2 245	2 153	339 730	33 360	9.8	13.2	393 110	35 095
Guatemala	112	167 445	1 451	0.9	7 598	2 680	218 581	4 731	2.2	6.8	386 026	6 182
Guyana	20	56 150	37	0.1	264	3	270	5	1.9	7.5	56 420	42
Haiti	59	111 088	3 978	0.4	...	3 106	198 394	18 880	9.5	5.3	309 482	22 858
Honduras	41	53 355	281	0.5	2 901	1 485	172 876	8 581	5.0	9.7	226 231	8 862
Jamaica	-	4 525	0	-	-	-	25 735	0	-	-	30 260	0
Mexico	605	1 605 671	10 844	0.7	60 852	5 570	353 468	12 332	3.5	5.3	1 959 139	23 176
Nicaragua	110	45 180	354	0.8	3 646	1 694	146 181	3 892	2.7	7.2	191 361	4 246
Panama	169	310 240	1 282	6.9	1 310	387	34 075	313	0.9	7.3	344 315	1 595
Paraguay	162	38 021	9	0.02	3 953	1 471	107 858	32	0.03	6.1	145 879	41
Peru	178	211 954	4 776	2.3	4 817	1 463	127 612	7 257	5.7	7.3	339 566	12 033
United States of Amer.	-	-	-	-	-	-	211[a]	211[a]	100.0	-	211[a]	211[a]
Trinidad and Tobago	...	3 135	0	-	...	...	13 333	2	0.02	-	16 468	2
Venezuela	388	84 717	4 424	5.2	2 446	446	161 100	7 131	4.4	28.8	245 817	11 555
Belize	13	20 396	38	0.2	127	39	4 018	61	1.5	8.6	24 414	99
Canal Zone	-	1 166	0	-	-	-	29 831	11	0.04	...	30 997	11
Dominica	-	-	-	-	-	-	11	0	-	-	11	0
French Guiana	...	7 059	141	2.0	...	...	2 680	343	12.8	-	9 739	484
Grenada	-	-	-	-	-	-	...	...	...	...	...	...
Guadeloupe	-	2 300	0	-	-	-	87	0	-	-	2 387	0
Puerto Rico	-	-	-	-	-	-	...	...	...	...	...	...
St. Lucia	-	-	-	-	-	-	100	0	-	-	100	0
Surinam	25	39 160	441	1.1	25	18	20 288	1 507	7.4	93.9	59 448	1 948
Total	-	5 486 479	89 874	1.6	-	-	3 914 287	190 270	4.9	-	9 400 766	280 144

a) Information up to October.

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

The Special Meeting of the Ministers of Health of Central America and Panama held in Washington, D. C. in March 1973, had as one of its main objectives the coordination of antimalarial activities on a subregional basis. The Ministers of Health agreed to intensify their joint efforts towards malaria eradication and to assure the financing of the programs, either from national resources or through possible outside assistance in the form of donation or loans.

The XIII Meeting of the Working Group to coordinate the ME programs of Central America and Panama was held in Guatemala from 8 to 21 June, 1973. The meeting was attended by Directors of the National Malaria Eradication Services of the countries concerned and technical staff from the Central American Research Station (CDC), AMRO-0200, AMRO-0216 and PAHO/Hqs. In this meeting, progress of work was reported and opinions were exchanged regarding the methods applied and the further investigations needed in order to solve current technical problems.

Besides the regional and subregional conferences, border meetings were organized among concerned countries to discuss problems of common interest and preventing of reintroduction of sources of infection from countries with persistent malaria transmission into neighboring countries where programs are at an advanced stage; 17 such meetings were held in 1973 among various countries of Central and South America.

The National Malaria Eradication Services (NMES), particularly in those countries where the program has reached consolidation and maintenance phases, participated in activities to provide general health services in rural areas, in accordance with the Ten-Year Health Plan.

In Colombia, the NMES has assumed the responsibility for the execution of additional health programs, such as Aedes aegypti eradication, yaws and leprosy control, and immunization activities. Additional funds and personnel were provided for these activities. In Cuba, where malaria has been eradicated, malaria vigilance activities are maintained by the general health services. In Ecuador, the NMES evaluators collaborated in the family planning program in the aspects of health education and canalization to maternal and child care centers.

In Costa Rica, the NMES personnel were trained in health activities to form part of the general health infrastructure in areas in the consolidation phase. The rural health program has its own financial resources with assistance of PAHO, UNICEF and AID. The NMES personnel, after proper training, are incorporated into the program. During the year, an extensive survey was carried out in 37 selected areas with 88,739 inhabitants to obtain basic information on health conditions in rural areas. Vaccination programs were begun in 15 areas during the year.

In the Dominican Republic, the NMES personnel continued to participate in health activities in three of the five regions of the country, serving 1.5 million inhabitants in rural areas. In Paraguay, a pilot project to extend health services to rural areas using NMES personnel and voluntary collaborators was continued. In the State of Rio de Janeiro, Brazil, and in the southern coastal region of Peru the NMES was integrated into the general health services, conducting health programs as well as malaria vigilance.

In El Salvador, the NMES has been integrated into the general health services since the beginning of 1973, although the program is still in the attack phase. In Central American countries, Guyana, Surinam and Paraguay, the NMES is also responsible for the Aedes aegypti eradication program.

Although integration of the NMES into the general health services is the ultimate goal, it must be done with caution, taking into account the progress of the ME program and the stage of the development of the health services in each country. Early integration may result in a setback in malaria eradication and yet, without strengthening the health services.

E. Budget

Previous reports noted that problems were experienced in several countries resulting from reductions in bilateral loan or grant assistance and withdrawal of UNICEF support in supplies and equipment to eradication programs. In 1973, to compensate for these reductions and as evidence of the continuing high priority placed on the eradication effort by Governments of the Hemisphere, national appropriations were increased for 16 of the 21 active programs and remained the same in two. However, the increase in appropriations by Governments from $47,371,865 in 1972 to 61,393,123 in 1973 did not represent an improvement in financing the programs, since it was needed to compensate for reductions in bilateral and UNICEF assistance.

Table 21 summarizes national expenditures for malaria eradication programs in 1972 and 1973 by country and gives the approved budget for 1974. As noted above, National expenditures increased by approximately 30 per cent in 1973 over 1972 and a 8.5 per cent increase is projected for 1974. Table 21 shows the reduced amount of loan funds available to the countries. Since 1970, supplementary assistance by loan funds has gradually declined from some $7,072,000 in 1970 to less than $600,000 in 1974.

Contributions by Governments and assisting agencies from 1957 through 1973 is shown in Graph 2. The figure reflects expenditures and is indicative of the importance being placed on the eradication effort in the Hemisphere. Nevertheless, inflation plus higher prices for insecticides and petroleum products required to maintain field operations may continue to affect program attack and evaluation activities adversely.

Table 22 summarizes the estimated budgetary and personnel requirements of PAHO/WHO for support of malaria eradication programs through 1976.

(Text continues on page 108)

Table 21

NATIONAL EXPENDITURES 1972, 1973 AND BUDGET 1974 FOR MALARIA ERADICATION IN THE AMERICAS

(In U. S. dollars)

Country or other political or administrative unit	National Expenditures 1972			Estimated National Expenditures 1973			National Budget 1974		
	Internal financing	Loans	Total	Internal financing	Loans	Total	Internal financing	Loans	Total
Argentina	786 663	-	786 663	1 499 492	-	1 499 492	...	...	...
Bolivia	197 060	-	197 060	277 968	-	277 968	306 715	-	306 715
Brazil	12 898 529	2 873 360	15 771 889	21 076 150	2 118 839	23 194 989	22 467 779	-	22 467 779
Colombia	2 952 601	-	2 952 601	3 349 593	-	3 349 593	3 227 642	-	3 227 642
Costa Rica	437 551	273 388	710 939	656 708	-	656 708	674 677	-	674 677
Cuba	...	...	...	...	...	...	...	...	...
Dominican Republic	779 580	-	779 580	779 580	-	779 580	779 580	-	779 580
Ecuador	1 288 199 a)	-	1 288 199 a)	1 518 218 a)	-	1 518 218 a)	1 781 376 a)	-	1 781 376 a)
El Salvador	888 163	-	888 163	1 716 314	-	1 716 314	...	...	...
Guatemala	1 635 614	-	1 635 614	1 720 526	-	1 720 526	2 311 190	-	2 311 190
Guyana	96 223	-	96 223	131 635	-	131 635	237 778	-	237 778
Haiti	35 000	-	35 000	131 000	-	131 000	200 000	-	200 000
Honduras	687 241	-	687 241	724 672	-	724 672	754 810	487 205 b)	1 242 015
Jamaica	33 692	-	33 692	47 305	-	47 305	52 255	-	52 255
Mexico	12 650 979	-	12 650 979	14 651 038	-	14 651 038	...	...	...
Nicaragua	1 197 576	-	1 197 576	1 298 426	-	1 298 426	1 455 793	-	1 455 793
Panama	1 239 770	-	1 239 770	1 377 276	-	1 377 276	1 434 428	-	1 434 428
Paraguay	698 575	217 342	915 917	604 566 c)	117 157 c)	721 723 c)	764 454	86 435	850 889
Peru	1 243 169	-	1 243 169	871 503 d)	-	871 503 d)	1 479 342	-	1 479 342
Trinidad and Tobago	723 541	-	723 541	811 394	-	811 394	...	...	...
Venezuela	5 826 162	-	5 826 162	7 034 706	-	7 034 706	7 268 864	-	7 268 864
Belize	55 151	-	55 151	64 848	-	64 848	72 727	-	72 727
French Guiana	625 346	-	625 346	625 346	-	625 346	631 599	-	631 599
Surinam	395 480	-	395 480	424 859	-	424 859	446 045	-	446 045
Total	47 371 865	3 364 090	50 735 955	61 393 123	2 235 996	63 629 119	46 347 054	573 640	46 920 694

... No information

a) Includes $546,558 from USA Agricultural Surpluses (PL 480 funds). b) Loan under negotiation. c) January/November expenditures.

d) January/September expenditures.

GRAPH 2

MALARIA ERADICATION IN THE AMERICAS
EXPENDITURES, 1957-1973

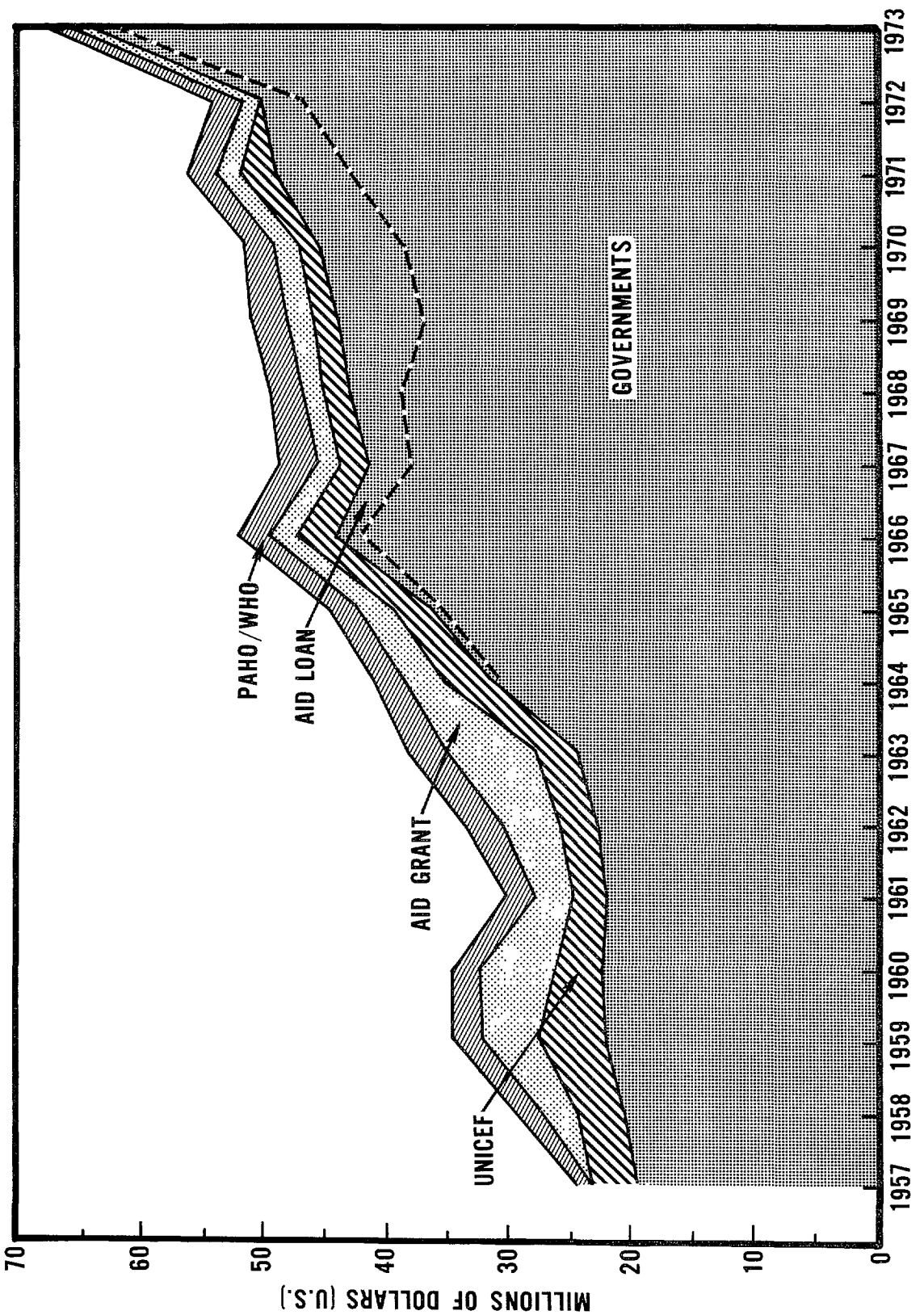


Table 22

ESTIMATED REQUIREMENTS FOR MALARIA ERADICATION PROGRAMS IN THE AMERICAS a)

	1973 b)	1974 c)	1975 c)	1976 c)
TOTAL COST	67 089 003	50 471 463	-	-
GOV. AND OTHER SOURCES	64 829 119	48 420 694 d)	(e)	(e)
PAHO/WHO PORTIONS:				
Personnel costs and travel	1 817 756	1 687 619	1 759 430	1 816 170
Supplies and equipment	345 165	261 050	238 150	239 850
Fellowships	14 139	17 100	4 500	6 000
Grants and others	82 824	85 000	76 550	83 750
TOTAL	2 259 884	2 050 769	2 078 630	2 145 770

SOURCES OF PAHO/WHO FUNDINGS

SOURCE	1973 b)	1974 c)	1975 c)	1976 c)
PAHO-Reg.	1 361 052	1 226 950	1 215 050	1 263 810
WHO-Reg.	838 571	823 819	836 580	882 020
WHO-UNDP	60 261	-	-	-
TOTAL	2 259 884	2 050 769	2 078 630	2 145 770

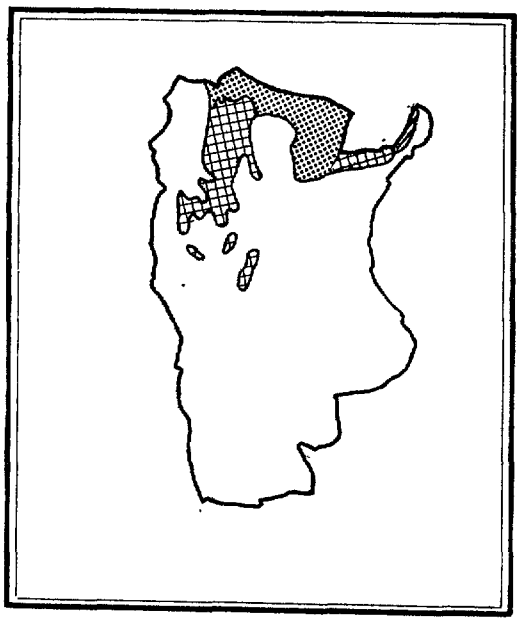
PAHO/WHO PERSONNEL

CATEGORY	1973	1974	1975	1976
Medical Officer	27	22	22	21
Sanitary Engineer	9	8	6	6
Entomologist	6	7	7	6
Parasitologist	2	2	2	2
Epidemiologist	2	2	2	2
Economist	1	1	1	1
Statistician	1	1	1	1
Adm. Methods Officer	2	1	1	1
Laboratory Adviser	1	1	1	1
Sanitary inspector	14	14	15	15
Other	13	13	13	13
TOTAL	78	72	71	69

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) The national budget from some countries is not available. e) No information available.

ARGENTINA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	24 251	4 024 458
Non malarious areas	21 245	3 675 407
Originally malarious areas		
Maintenance phase	1 887	133 661
Consolidation phase	1 119	215 390
Attack phase	-	-
Total originally malarious areas	3 006	349 051

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	60	62
Evaluation operations	3	221	224
Administrative and other	-	137	137
Transport	-	58	58
Total	5	476	481

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	134	134
Two-wheel vehicles	-	-	-	-
Boats	-	-	4	4
Animals	-	-	5	5
Other	-	-	-	-
Total	-	-	143	143

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
14th	Jan. 72-Dec. 72	(d)	...	32 261[d]	...	97 223[d]	...	...
15th	Jan. 73-Dec. 73	(d)	...	31 507	...	88 712	...	...

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	-	-	-	-

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	-

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.)

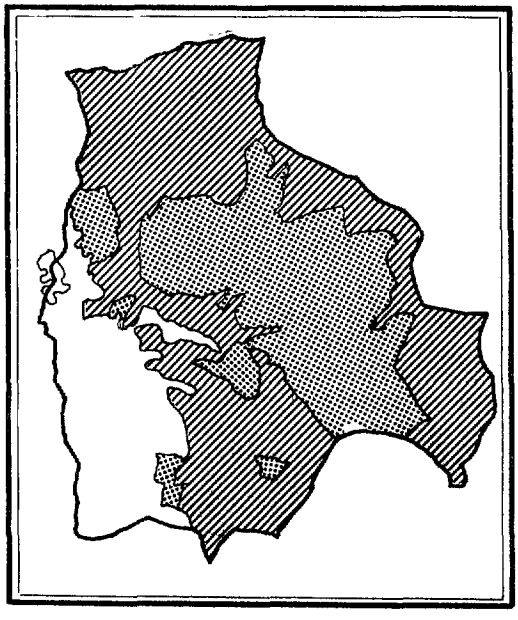
MAINTENANCE PHASE AREAS

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	-

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

BOLIVIA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	5 343	1 098 581
Non malarious areas	3 623	277 235
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 025	367 940
Attack phase	695	453 406
Total originally malarious areas	1 720	821 346

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	49 (124)	49 (124)
Evaluation operations	9	117	126
Administrative and other	-	31	31
Transport	-	40	40
Total	9	237 (124)	246 (124)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	12	30	11	53
Two-wheel vehicles	-	20	-	20
Boats	10	10	5	25
Animals	-	-	70	70
Other	14	20	17	51
Total	36	80	103	219

(Part-time personnel in parentheses)

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-Dec. 73	29th 30th	37 356 36 076	37 539 31 477	24-25	15 587	16 221[d]	138 018 130 882	141 381 122 049	520 504	- -	7.3 7.6

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		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
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	-

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	-

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

BRAZIL

STATUS OF MALARIA PROGRAM AT DECEMBER 1973

	Population (thousands)	Area km^2
TOTAL COUNTRY	102 927	8 511 965
Non malarious areas	61 438	1 614 074
Originally malarious areas		
Maintenance phase	4 388	82 402
Consolidation phase	14 388	179 025
Attack phase	22 713	6 626 464
Total originally malarious areas	41 489	6 897 891

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	31	6 676	6 707
Evaluation operations	50	4 036	4 086
Administrative and other	2	156	158
Transport	-	698	698
Total	83	11 566	11 649

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	263	23	759	1 045
Two-wheel vehicles	-	550	-	550
Boats	-	-	366	366
Animals	1 462	-	-	1 462
Other	-	-	7	7
Total	1 725	573	1 132	3 430

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	3 152 465	12 220 193	12 014 195	455	7.2

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-Dec. 73	27th	12 057	10 597	34 500	32 102	402	8. 7

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

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	1 439	132 231	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	185	533	-
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	-

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 case.

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	-

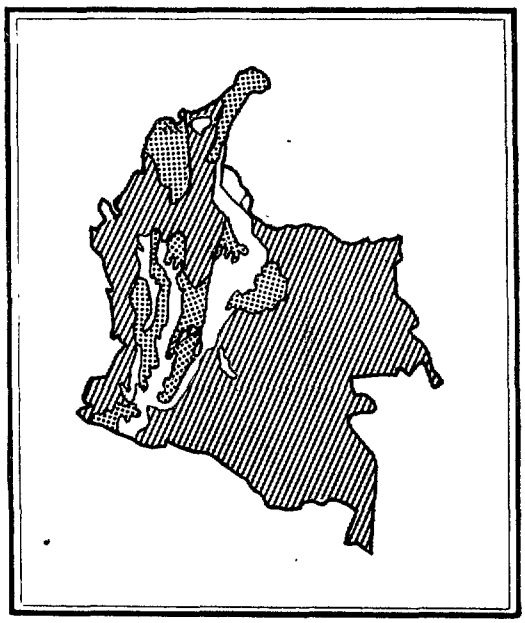
CONSOLIDATION PHASE AREAS

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	235	322	-
1973	2 618	109 129	4.2	435	10	-	-	323	1	-	101[c]	168	267	-
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

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

COLOMBIA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	23 209	1 138 914
Non malarious areas	9 562	168 065
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	9 292	113 176
Attack phase	4 246	834 387
Preparatory phase	109	23 286
Total originally malarious areas	13 647	970 849

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	10	758	768
Evaluation operations	16	979	995
Administrative and other	-	178	178
Transport	-	351	351
Total	26	2 266	2 292

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	131	90	148	369
Two-wheel vehicles	-	190	51	241
Boats	102	135	27	264
Animals	500	719	60	1 279
Other	125	156	33	314
Total	858	1 290	319	2 467

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

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

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	-

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

COSTA RICA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973

	Population (thousands)	Area km^2
TOTAL COUNTRY	1 887	50 900
Non malarious areas	1 283	15 454
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	417	19 941
Attack phase	187	15 505
Total originally malarious areas	604	35 446

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	80	80
Evaluation operations	2	133	135
Administrative and other	1	57	58
Transport	-	20	20
Total	3	290	293

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	9	10	1	20
Two-wheel vehicles	-	58	46	104
Boats	-	-	14	14
Animals	-	46	-	46
Other	-	-	-	-
Total	9	114	61	184

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

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.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	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	2 060	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	-

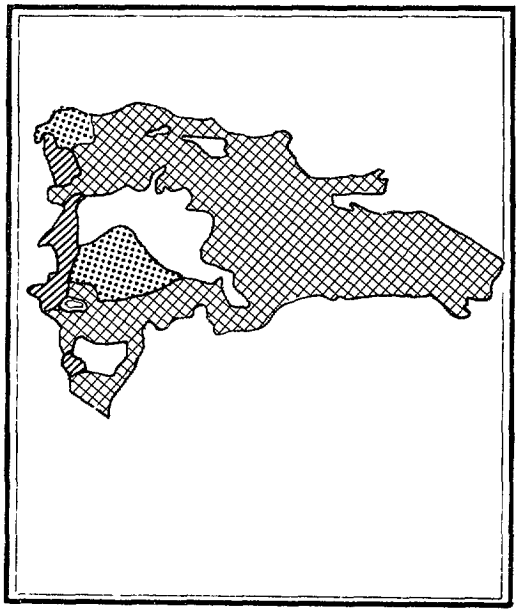
CONSOLIDATION PHASE AREAS

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]	230	52 594[a]	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	-

a) Started in July 1962.

DOMINICAN REPUBLIC

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	4 498	48 442
Non malarious areas	31	880
Originally malarious areas		
Maintenance phase	4 109	39 885
Consolidation phase	271	4 932
Attack phase	87	2 745
Total originally malarious areas	4 467	47 562

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	14	15
Evaluation operations	2	234	236
Administrative and other	1	41	42
Transport	-	31	31
Total	4	320	324

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	6	48	7	61
Two-wheel vehicles	-	129	-	129
Boats	-	-	-	-
Animals	-	73	-	73
Other	-	-	-	-
Total	6	250	7	263

DOMINICAN REPUBLIC (Cont.)

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed with DDT						Inhabitants directly protected		Insecticide used per house (g. technical) DDT	Average houses sprayed per spray-man/day
		Twice a year			Once a year						
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected		
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
		11-A	6 066	5 599	-	-	-	24 443	25 147	381	7.3
14th	Jun. 73-Oct. 73	11-B	6 205	5 163	-	-	-	25 147	23 506	388	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	-	-

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	-	-

a) June - December.

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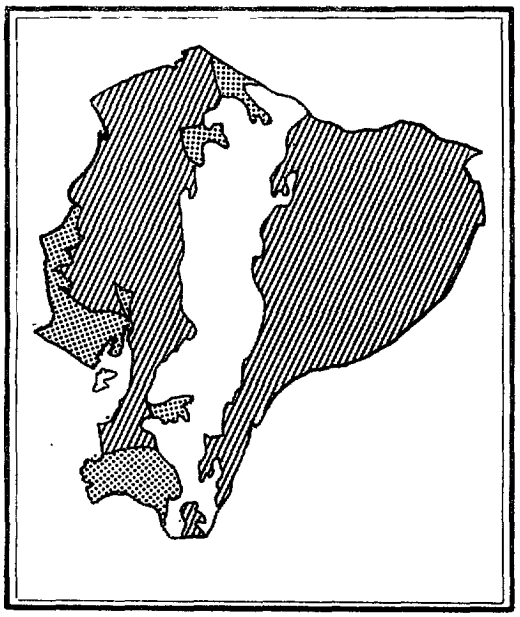
STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	6 714	291 906
Non malarious areas	2 838	116 444
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 644	27 797
Attack phase	2 232	147 665
Total originally malarious areas	3 876	175 462

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	3	675	678
Evaluation operations	13	176	189
Administrative and other	2	81	83
Transport	-	118	118
Total	18	1 050	1 068

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	85	8	8	101
Two-wheel vehicles	-	64	4	68
Boats	43	8	-	51
Animals	368	10	-	378
Other	1	-	-	1
Total	497	90	12	599

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 542a	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 430c)	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 889d)	-	-	-	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 524e)	-	-	-	...	43 856	519	-	6.2
		20th	375 411	6 308e)				...	37 359	547		6.1
11th	Jan. 68-Jan. 69	21st	96 429	91 538f)	-	-	-	412 868	391 841	551	-	5.8
		22nd	254 234	239 429f)				1 247 637	1 103 686	479		6.8
12th	Feb. 69-Jan. 70	23rd	321 655	308 631e)	-	-	-	1 496 262	1 405 607	573	-	7.4
		24th	352 330	339 908e)				1 527 804	1 509 280	603		7.8
13th	Jan. 70-Dec. 70	25th	359 494	339 793e)	-	-	-	1 623 163	1 563 261	605	-	7.5
		26th	346 930	328 728e)				1 595 285	1 389 097	610		7.5
14th	Jan. 71-Dec. 71	27th	378 822	346 973e)	-	-	-	1 716 064	1 571 166	638	-	7.2
		28th	377 765	283 821e)				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 132g)	181 697g)	713 221	654 140	640	336g)	6.7
16th	Jan. 73-Dec. 73	31st	348 020	250 997e)	...	173 981h)	74 843h)	1 566 090	1 127 051	629	624h)	6.8
		32nd	188 708	138 853e)				845 499	616 091	661		6.7

a) Sycle 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.

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	711b)	5 515	-
1973	240 116	6 102	2.5	774b)	5 328	-

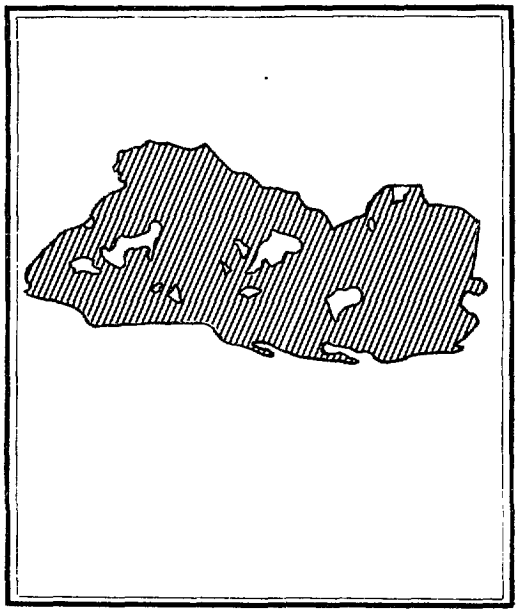
CONSOLIDATION PHASE AREAS

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	2 903	257	4 042	-
1971	1 325	112 266	8.5	690	145	-	1	297	-	8	239c)	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	-

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

EL SALVADOR

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	3 800	21 149
Non malarious areas	550	2 494
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	3 250	18 655
Total originally malarious areas	3 250	18 655

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	249	250
Evaluation operations	5	161	166
Administrative and other	1	30	31
Transport	-	62	62
Total	7	502	509

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	23	16	8	47
Two-wheel vehicles	-	20	-	20
Boats	-	-	8	8
Animals	-	-	-	-
Other	-	-	-	-
Total	23	36	16	75

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				319	
					3rd	46 072	16 764	323 981	254 388	453	339	10.3
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

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 partially sprayed with propoxur. e) Includes 381 314 houses partially sprayed with propoxur in 10 cycles carried through by the SNEM; and 43 173 houses in 9 cycles carried through by AMRO-0216. (Partially sprayed with propoxur).

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive				
		Number	Percentage	P. falciparum a)	P. vivax	P. malariae
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	-

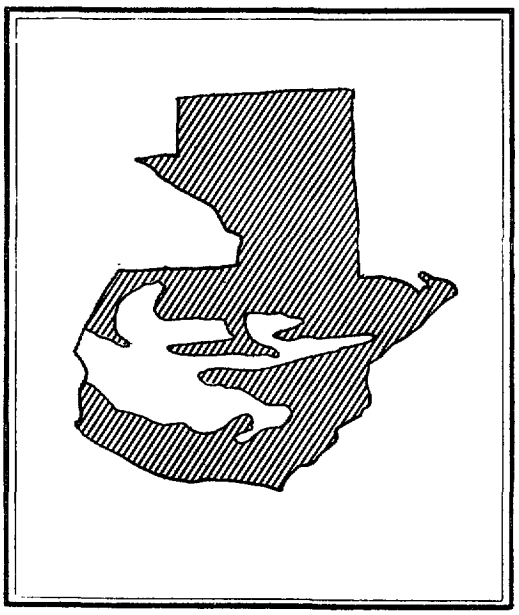
CONSOLIDATION PHASE AREAS

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.

GUATEMALA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	5 212	108 889
Non malarious areas	3 060	28 539
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	2 152	80 350
Total originally malarious areas	2 152	80 350

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	448	448
Evaluation operations	2	190	192
Administrative and other	-	63	63
Transport	-	51	51
Total	2	752	754

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	36	1	56	93
Two-wheel vehicles	103	88	1	192
Boats	4	2	8	14
Animals	66	-	-	66
Other	9	-	-	9
Total	218	91	65	374

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	492	245	7.7
		14th	139 553	134 154[g]	10th-11th	206 731	192 830	461 428	473 072	490	230	7.6

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	-

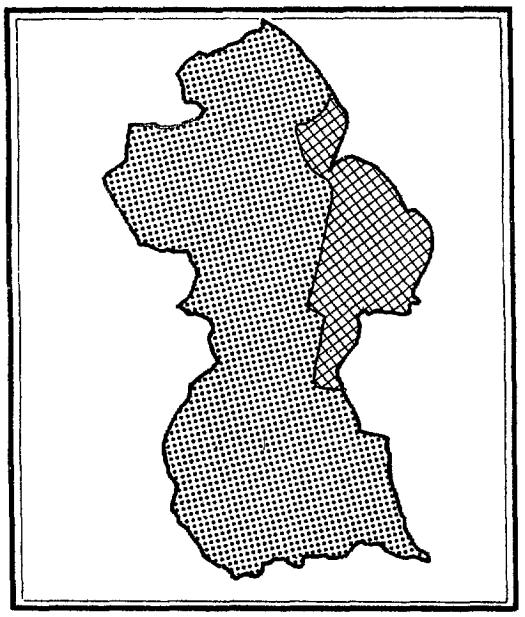
CONSOLIDATION PHASE AREAS

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.

GUYANA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	780	215 025
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	732	39 437
Consolidation phase	48	175 588
Attack phase	-	-
Total originally malarious areas	780	215 025

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	10	10
Evaluation operations	1	60	61
Administrative and other	-	18	18
Transport	-	21	21
Total	1	109	110

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	2	6	-	8
Two-wheel vehicles	-	2	-	2
Boats	7	-	6	13
Animals	-	-	5	5
Other	-	-	-	-
Total	9	8	11	28

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

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
1958	1520	51	3.36	23	8	20
1959	3754	176[a]	4.69	53	100	13
1960	3674	263[a]	7.16	175	67	12
1961	15515	218	1.41	57	156	5
1962	14358	425	2.96	266	159	-
1963	16780	473[a]	2.82	414	56	-
1964	35091	223	0.64	190	33	-
1965	22950	25	0.11	24	1	-
1966	14098	17	0.12	15	2	-
1967	21389	175	0.82	145	29	1
1968	32064	44	0.14	20	24	-
1969	47966	12	0.03	12	-	-

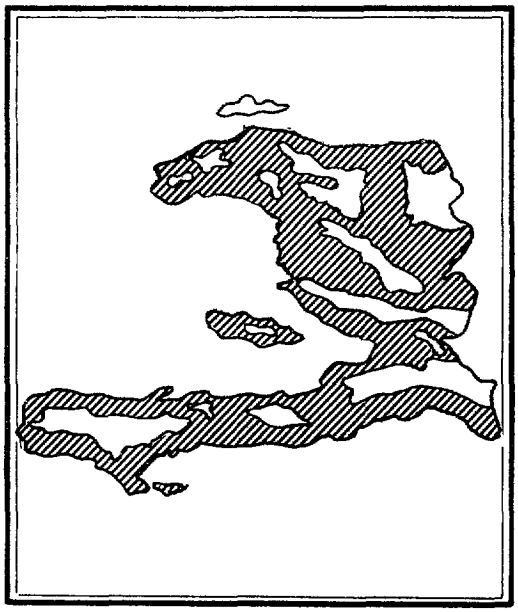
CONSOLIDATION PHASE AREAS

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	15500	59.6	1	1	-	-	-	-	-	-	-	1	-
1966	30	22141	73.8	882	...	...	...	...	...	...	...	-	882	-
1970[b]	43	45986	107.0	17	-	-	15	-	-	-	2	9	8	-
1971	44	51138	116.2	26	11	-	12	-	-	13	-	17	8	1
1972	46	51632	112.2	263	230	-	23	-	-		-	145	118	-
1973	48	51344	107.0	42	34	1	-	5	-		1	4	38	-
MAINTENANCE PHASE AREAS														
1958	430	1	0.0	-	-	-	-	-	-	-	-	-	-	-
1959	460	-	0	-	-	-	-	-	-	-	-	-	-	-
1960	494	-	0	-	-	-	-	-	-	-	-	-	-	-
1961	515	1374	0.3	13	-	-	1	12	-	-	-	1	12	-
1962	556	21088	3.8	21	17	3	-	1	-	-	-	-	21	-
1963	572	15475	2.7	3	-	2	1	-	-	-	-	1	2	-
1964	589	20094	3.4	2	-	-	2	-	-	-	-	2	-	-
1965	602	23057	3.8	2	-	-	1	-	-	1	-	2	-	-
1966	627	17430	2.8	11	...	...	...	...	...	...	...	1	10	-
1967	637	12774	2.0	-	-	-	-	-	-	-	-	-	-	-
1968	658	23153	3.5	17	-	-	-	17	-	-	-	7	10	-
1969	678	22155	3.3	7	-	-	1	6	-	-	-	1	6	-
1970	671	17637	2.6	1	-	-	-	-	-	-	1	-	1	-
1971	691	14829	2.1	1	-	-	1	-	-	-	-	-	1	-
1972	711	8299	1.2	3	-	-	2	-	-	-	1	2	1	-
1973	732	5076	0.7	0	-	-	-	-	-	-	-	-	-	-

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

HAITI

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	5 103	27 750
Non malarious areas	1 343	8 650
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	3 760	19 100
Total originally malarious areas	3 760	19 100

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	772	774
Evaluation operations	11	302	313
Administrative and other	-	28	28
Transport	-	54	54
Total	13	1 156	1 169

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	162	-	-	162
Two-wheel vehicles	-	-	-	-
Boats	1	-	-	1
Animals	-	-	-	-
Other	-	-	-	-
Total	163	-	-	163

HAITI (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. 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

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.

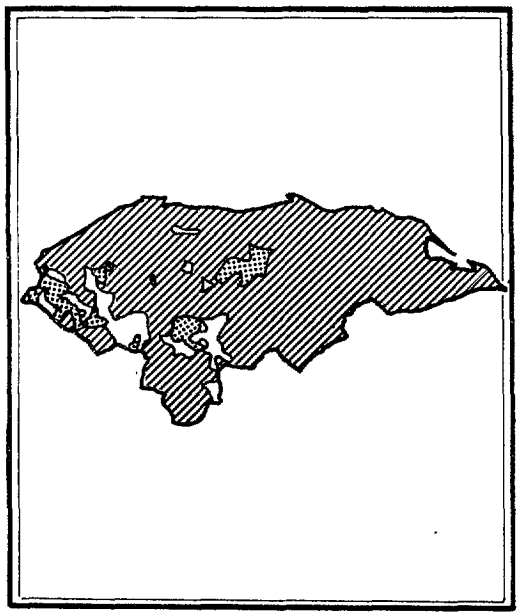
HAITI (Cont.)

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

HONDURAS

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	2776	112088
Non malarious areas	350	10737
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	468	7123
Attack phase	1958	94228
Total originally malarious areas	2426	101351

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	236	236
Evaluation operations	1	98	99
Administrative and other	2	49	51
Transport	-	38	38
Total	3	421	424

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	40	10	22	72
Two-wheel vehicles	-	70	1	71
Boats	-	-	-	-
Animals	21	66	-	87
Other	-	-	-	-
Total	61	146	23	230

HONDURAS (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	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	126 499	110 612	1st 2nd	19 776 17 471	20 440 18 286	781 085	712 355	404	440 343	10.5
		10th	14 851	27 719	3rd	21 499	23 066	171 805	240 031	505	575	9.0
6th	Sep. 64-Jun. 65	11th	21 502	37 818	4th 5th	23 274 22 039	23 614 24 997	328 950	425 513	567	550 411	8.4
		12th	30 377	35 603	-	-	-	137 790	161 522	474	-	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	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

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 two quarterly cycles g) Includes 87 118 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) In addition 126 844 houses were sprayed with Propoxur in seven cycles in Marcovia.

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	-

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

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

MEXICO

STATUS OF MALARIA PROGRAM AT DECEMBER 1973

	Population (thousands)	Area km^2
TOTAL COUNTRY	53 665	1 967 183
Non malarious areas	26 292	817 183
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	13 037	424 694
Attack phase	14 336	725 306
Total originally malarious areas	27 373	1 150 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	48	4 208	4 256
Evaluation operations	67	1 078	1 145
Administrative and other	3	679	682
Transport	-	243	243
Total	118	6 208	6 326

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	478	501	349	1 328
Two-wheel vehicles	-	-	-	-
Boats	52	-	-	52
Animals	2 258	146	-	2 404
Other	-	-	-	-
Total	2 788	647	349	3 784

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum a)	P. vivax	P. malariae
		Number	Percentage			
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

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

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

b) January-September.

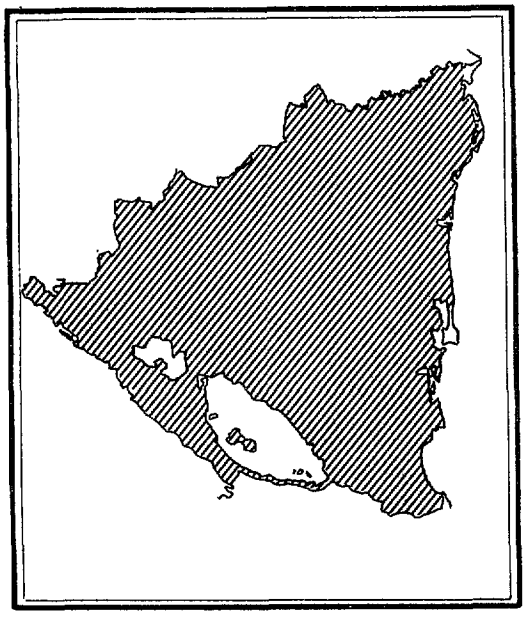
SPRAYING OPERATIONS

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	-	-	-	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-3rd[h]	165 197 h]	186 767[h]	9 045 060	9 007 813	475	382[h]	8.0
		34th	1 762 630	2 322 297[g]				6 816 175	9 034 142	475		7.9

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.

NICARAGUA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	2 073	127 358
Non malarious areas	-	9 000
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	2 073	118 358
Total originally malarious areas	2 073	118 358

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	246	248
Evaluation operations	4	155	159
Administrative and other	-	51	51
Transport	-	59	59
Total	6	511	517

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	56	56
Two-wheel vehicles	-	15	-	15
Boats	-	-	18	18
Animals	-	-	-	-
Other	-	1	-	1
Total	-	16	74	90

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	356 480	930 917 932 500	931 134 894 151	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	331 993	693 913 989 856	690 720 969 178	352 368	191[e]	9.2 9.2

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 wuarterly spraying cycles with propoxur, beginning 6 Aprol. d) Summary of 4 cycles with malathion. e) Summary of 4 cycles with propoxur.
f) Total houses sprayed with DDT, malathion and propoxur. g) Total houses sprayed 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	-

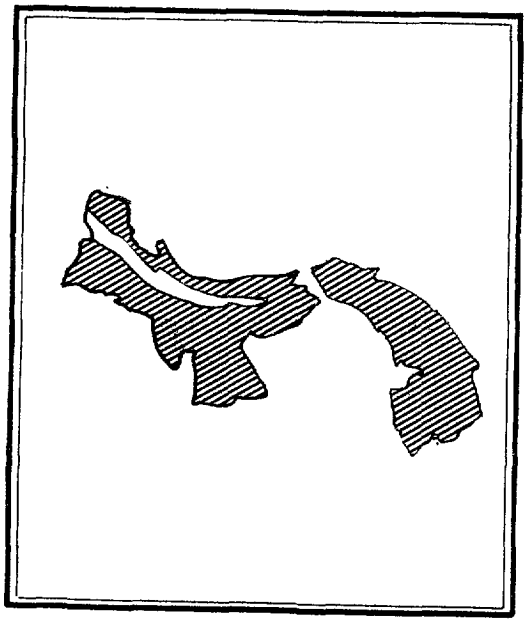
CONSOLIDATION PHASE AREAS

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.

PANAMA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	1570	75 650
Non malarious areas	60	5 810
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	1 510	69 840
Total originally malarious areas	1 510	69 840

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	294	294
Evaluation operations	2	208	210
Administrative and other	-	65	65
Transport	-	18	18
Total	2	585	587

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	63	15	9	87
Two-wheel vehicles	-	71	-	71
Boats	19	27	-	46
Animals	-	-	-	-
Other	-	-	-	-
Total	82	113	9	204

PANAMA (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	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	175 622	174 779	-	(b)	1 101 c)	710 918	711 983	490	63	8.1
		2nd	182 784	184 355			1 192 c)	714 320	726 944	510	103	8.8
6th	May 63-Apr. 64	3rd	197 379	193 960	-	(b)	1 024 c)	733 060	724 166	477	77	8.9
		4th	205 165	176 912			1 268 c)	771 827	670 310	455	71	9.3
7th	May 64-Jun. 65	5th	209 126	201 976	-	(b)	1 078 c)	750 420	728 633	440	77	9.0
		6th	206 495	183 650		1 332	1 867 c)	724 990	647 164	421	77	9.0
8th	Jul. 65-Jun. 66	7th	205 050	196 902	-	1 105	1 133 c)	730 020	701 266	421	73	8.8
		8th	211 390	193 629		...	1 249	710 101	654 648	416	71	7.4
9th	Jul. 66-Jun. 67	9th	215 450	196 258	-	1 250	1 315	720 552	664 620	428	83	7.5
		10th	217 620	197 700		-	-	761 670	712 459	432	-	8.0
10th	Jul. 67-Jun. 68	11th	201 950	194 832	-	-	-	706 825	649 039	431	-	8.3
		12th	205 148	168 479				759 048	584 220	436		7.5
11th	Jul. 68-Jun. 69	13th	207 214	165 285	-	-	-	766 692	563 486	423	-	7.0
		14th	208 154	183 546				749 354	644 757	434		7.6
12th	Jul. 69-Jun. 70	15th	215 369	196 003	-	-	-	755 945	757 402	495	-	7.1
		16th	208 281	203 098				757 402	775 191	472		7.7
13th	Jul. 70-Jun. 71	17th	189 385	187 414	1-2nd d)	-	39 316 d)	698 842	688 722	479	-	7.3
		18th	201 656	197 882	3-6th d)	54 300	55 278d)	853 503	825 776	471		7.5
14th	Jul. 71-Jun. 72	19th	177 683	174 339				750 777	736 826	464	-	7.5
		20th	132 985	125 341	7-10th d)	47 164	42 622	484 451	438 096	461		7.2
15th	Jul. 72-Jun. 73	21st	131 447	126 008				463 653	424 765	458	-	7.7
		22nd	91 164	77 482	11-14th d)	26 564	24 802 d)	318 170	262 202	467	-	7.0
16th	Jul. 73-Dec. 73	23rd	103 356	92 157 e)	5-8th f)	13 304	12 462 f)	363 131	334 446 e)	478	-	6.3

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 9 066 houses sprayed in annual cycle. f) Four quarterly cycles with Propoxur.

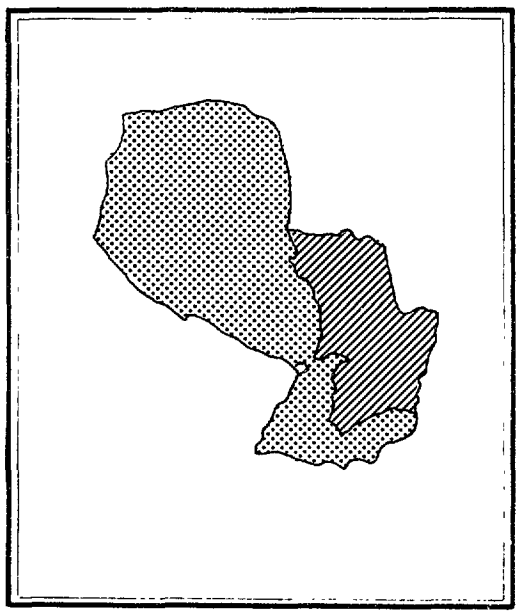
EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

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	-

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

PARAGUAY

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	2 389	406 752
Non malarious areas	398	200
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 158	301 189
Attack phase	833	105 363
Total originally malarious areas	1 991	406 552

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	156	157
Evaluation operations	5	199	204
Administrative and other	-	97	97
Transport	-	60	60
Total	6	512	518

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	108	4	4	116
Two-wheel vehicles	-	229	6	235
Boats	7	14	-	21
Animals	-	-	-	-
Other	14	27	-	41
Total	129	274	10	413

PARAGUAY (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	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 2nd	330 000 314 102	304 100 311 000	-	-	-	1 500 000 1 430 000	1 384 606 1 461 027	472 448	-	8. 2 9. 1
2nd	Oct. 69-Sep. 70	3rd 4th	317 805 317 142	313 917 303 370	-	-	-	1 397 988 1 370 225	1 378 239 1 285 511	477 523	-	9. 3 8. 5
3th	Oct. 70-Sep. 71	5th 6th	308 357 256 189	300 154[d] 255 789[d]	-	-	-	1 286 295 1 053 446	1 298 275 1 065 384	535 538	-	8. 7 8. 5
4th	Oct. 71-Sep. 72	7th 8th	227 811 191 980	228 570 187 529	- -	- -	- -	962 015 785 294	943 668 753 124	536 522	- -	8. 7 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

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

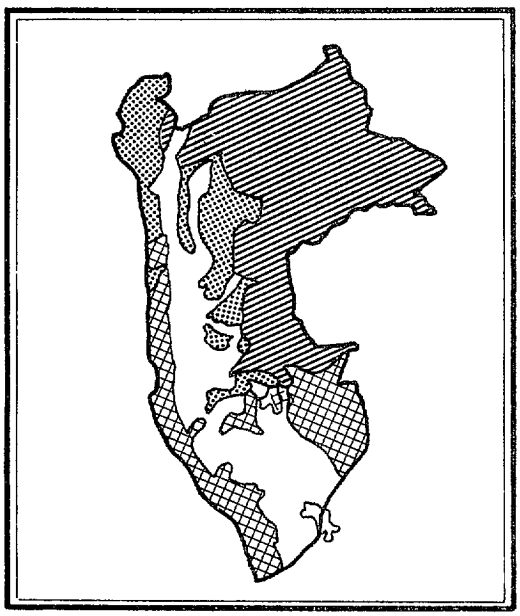
Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum[a]	P. vivax	P. malariae
		Number	Percentage			
1958	14 359	526	3.7	...	...	...
1959	11 379	641	5.6	1	640	-
1960	47 045	1 165	2.5	5	1 159	1
1961	27 995	1 528	5.5	9	1 519	-
1962	48 184	5 756	11.9	313	5 443	-
1963	92 806	3 443	3.7	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	-

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	1158	60 011	5.2	0	-	-	-	-		-	-	-	-	-

PERU

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	14 889	1 285 215
Non malarious areas	9 699	324 044
Originally malarious areas		
Maintenance phase	1 421	195 818
Consolidation phase	2 503	221 930
Attack phase	1 266	543 423
Total originally malarious areas	5 190	961 171

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	303	305
Evaluation operations	14	275	289
Administrative and other	-	98	98
Transport	-	55	55
Total	16	731	747

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	14	89	23	126
Two-wheel vehicles	-	5	-	5
Boats	10	260	17	287
Animals	-	-	-	-
Other	2	29	-	31
Total	26	383	40	449

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

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 OP ATIONS, 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

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	-

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

PERU (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						
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

a) Four cases imported from consolidation phase areas.

VENEZUELA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973

	Population (thousands)	Area km^2
TOTAL COUNTRY	11 218	912 050
Non malarious areas	2 804	312 050
Originally malarious areas		
Maintenance phase	7 912	460 054
Consolidation phase	-	-
Attack phase	502	139 946
Total originally malarious areas	8 414	600 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	4	449	453
Evaluation operations	14	494	508
Administrative and other	(a)	(a)	(a)
Transport	(a)	(a)	(a)
Total	18	943	961

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	157	144	-	301
Two-wheel vehicles	42	315	-	357
Boats	45	88	-	133
Animals	365	335	-	700
Other	86	-	-	86
Total	695	882	-	1 577

(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

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

VENEZUELA (Cont.)

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	8.1	2 289	6 298	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.)

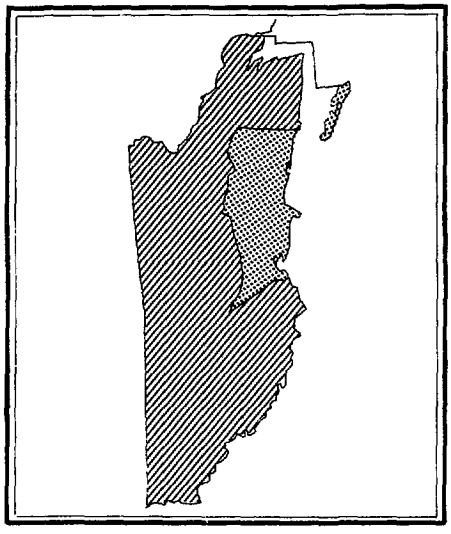
MAINTENANCE AND NON-MALARIOUS AREAS [a]

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	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	-

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

BELIZE

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	132	22 965
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	55	4 307
Attack phase	77	18 658
Total originally malarious areas	132	22 965

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	20	20
Evaluation operations	(1)	16 (3)	16 (4)
Administrative and other	-	4	4
Transport	-	2	2
Total	(1)	42 (3)	42 (4)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	4	8	1	13
Two-wheel vehicles	-	-	1	1
Boats	-	-	6	6
Animals	-	-	-	-
Other	-	-	-	-
Total	4	8	8	20

(Part-time personnel in parentheses)

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

a) New coverage started.

BELIZE (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		P. falciparum	P. vivax	P. malariae
		Number	Percentage			
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	-

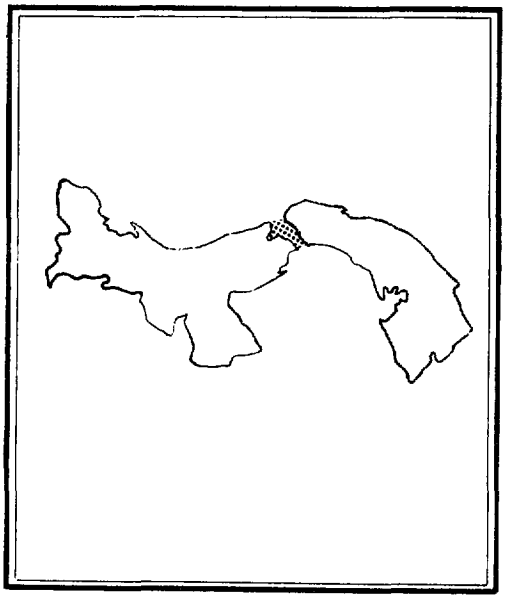
CONSOLIDATION PHASE AREAS

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	-

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.

CANAL ZONE

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	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	-	(23)	(23)
Evaluation operations	-	(17)	(17)
Administrative and other	-	-	-
Transport	-	(4)	(4)
Total	-	(44)	(44)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	-	-
Two-wheel vehicles	-	-	(2)	(2)
Boats	-	-	-	-
Animals	-	-	(4)	(4)
Other	-	-	-	-
Total	-	-	(6)	(6)

(Figures in parentheses are to be considered as part-time)

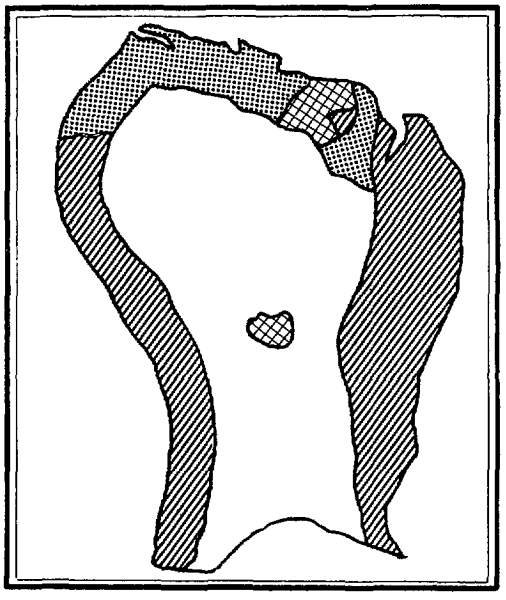
EPIDEMIOLOGICAL EVALUATION OPERATIONS, CONSOLIDATION PHASE AREAS

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	-

a) January-November.

FRENCH GUIANA

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	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	-	69	69
Evaluation operations	3	12	15
Administrative and other	-	-	-
Transport	-	26	26
Total	3	107	110

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	11	-	-	11
Two-wheel vehicles	-	-	-	-
Boats	3	-	-	3
Animals	-	-	-	-
Other	9	-	-	9
Total	23	-	-	23

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	...	-	-	-

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.

FRENCH GUIANA (Cont.)

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	-

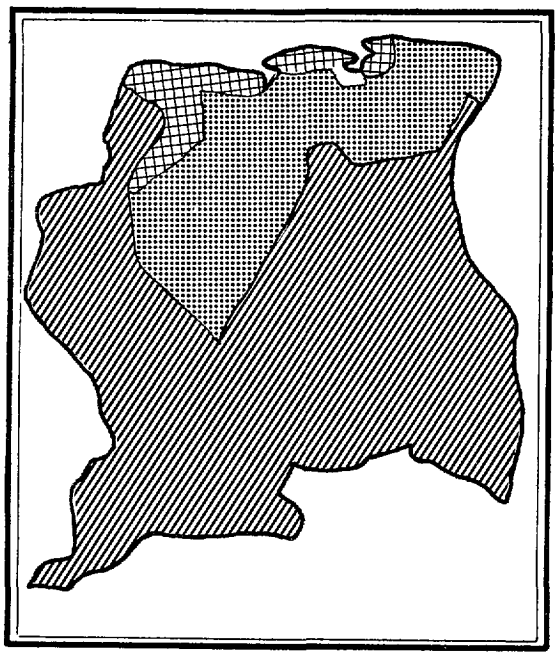
CONSOLIDATION PHASE AREAS

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	-	-
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	-

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

SURINAM

STATUS OF MALARIA PROGRAM AT DECEMBER 1973



	Population (thousands)	Area km^2
TOTAL COUNTRY	405	163 820
Non malarious areas	146	70
Originally malarious areas		
Maintenance phase	184	8 955
Consolidation phase	43	55 345
Attack phase	32	99 450
Total originally malarious areas	259	163 750

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	24	24
Evaluation operations	1	39	40
Administrative and other	-	29	29
Transport	-	69	69
Total	1	161	162

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	9	9
Two-wheel vehicles	-	7	-	7
Boats	-	-	-	-
Animals	-	-	23	23
Other	-	-	-	-
Total	-	7	32	39

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

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	-

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	199 d)	14 905 d)	7.5	70 d)	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	-	-
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	-	-

III. SPECIAL TECHNICAL PROBLEMS

A. General Status

As discussed in Chapter I, there are 14 political units where no significant progress was made during the last 10 years, at least in some part of their territories. Aside from financial, administrative and operational difficulties, there are technical problems which affect the progress of the programs and make operations more difficult and expensive. There are: 1) the vector's physiological resistance to the commonly used insecticides; 2) behavioral resistance, which exists when the vector avoids contact with surfaces sprayed with residual action insecticides; 3) the parasite's resistance to antimalarial drugs; and 4) human ecology, particularly migration, settlement and precarious housing. While the first three problems are found in specific localities in certain countries, the last one is rather universal in areas with persistent malaria transmission.

The vector's physiological resistance to DDT has been one of the principal problems along the Pacific coast in El Salvador, Guatemala, Honduras and Nicaragua. The population in these areas is about 2,758,000 or 27,8 per cent of the total living in the malarious areas of these four countries. Propoxur has been substituted for DDT since 1970-1971 with good results. However, in the central and western coastal area of El Salvador the vector was also found to be resistant to propoxur, first in a few localities in 1972, but in a larger area in 1973. The use of organophosphorous and other carbamate insecticides for crop protection apparently caused rapid development of such vector resistance. In a small group of localities in Guatemala where propoxur has been used during the last three years, resistance to this insecticide was also found late in 1973.

The vector has also been found to be physiologically resistant to DDT in some areas of Mexico and Haiti. In the latter, the problem seemed to be increasing along the southern peninsula where the malaria transmission potential is high. Taking this together with other operational and financial problems, much difficulty is anticipated. A similar problem was identified in Costa Rica and Panama, but the use of propoxur has solved the problem and no malaria transmission was observed in the area during 1973.

Behavioral resistance of A. nuñeztovari has been a problem in western Venezuela and in eastern and norther Colombia, where DDT has not been able to interrupt malaria transmission completely, but only to bring it down to a certain level. This problem, together with intensive colonization and with drug resistance of P. falciparum, makes progress extremely slow.

Strains of P. falciparum resistant to Chloroquine have been identified in parts of Brazil, Colombia, Guyana, Panamá, Surinam and Venezuela. Alternative drugs are available for radical cure treatment, but they are not recommended for mass drug administration. However, if the insecticides are effective in interrupting transmission, the problem of parasites resistant to drugs is of less epidemiological importance. On the other hand, where the insecticides are only partially effective, as in Colombia, the parasites' resistance to Chloroquine constitutes another major problem in the program (Map 3).

The problems associated with population dispersion, habits, migration and human ecology in general have been the most common and important factors which contribute to the persistence of transmission. In the last 15 years, all the countries in this Hemisphere have extended their plan for economic development and consequently much land previously unused of unfavorable health conditions, has been opened and many roads constructed. Most of these new settlements of population are in areas with high vector density and with other epidemiological factors favorable for malaria transmission. A complete interruption of transmission in such areas may be extremely difficult with regular attack measures and financial resources. On the other hand, if malaria transmission persists in such areas, it provides permanent sources of infection for the rest of the country and jeopardizes economic development.

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

No.	Country and Area
	BRAZIL
1	Marcelos (Amazonas)
2	Pto. Velho (Rondonia)
3	R. Machado (Rondonia)
4	Cuiabá (Mato Grosso)
5	Três Lagoas (Mato Grosso)
6	Conceição da Barra (Esp. Santo)
7	Alenquer (Pará)
8	Santarém (Pará)
9	S. Miguel Guamá (Pará)
10	Belem (Pará)
11	Igoraperimirim (Pará)
12	Barcarena (Pará)
13	Belem-Brasilia Highway (Pará)
14	R. Gurupi (Pará)
15	Braz Aguiar (Roraima)
16	Nucajaí (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	(T. F. Amazonas)
	Barinas

B. Activities for solving technical problems

Table 23 summarizes the areas with technical problems and the activities being carried out to solve them, and Map 4 shows the affected areas.

1. Use of other insecticides

In countries of Central America (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua) propoxur continued to be used in areas where the vector had developed physiological resistance to DDT and dieldrin. Results continued to be highly satisfactory in several of the countries. Propoxur was also utilized in limited areas of Panama and in field trials in Venezuela. However, the increasing development of the vector's physiological tolerance and resistance to propoxur in extensive areas of El Salvador has compounded problems of attacking malaria in that country.

2. Larvicides

Larviciding as a supplementary or alternative attack measure continued in a limited number of urban or densely populated areas of Haiti, Mexico, Nicaragua, Panama, and the Dominican Republic. Field trials in Brazil in the cities of Manaus and Belem showed very encouraging results during the year.

3. Mass Drug Administration

Mass drug administration was carried out in Colombia, Guatemala, Haiti, Peru and French Guiana in 1973 as a supplement to residual house spraying. The measures were effective wherever good coverage was obtained. However, in Colombia especially in the Urabá area, the effectiveness of Chloroquine distribution was reduced due to resistance to this drug in the local strain of P. falciparum (Table 24).

The distribution of medicated salt in Surinam since 1966 was discontinued in September 1973, in view of the appearance of a few cases of P. falciparum resistant to the drugs used (Four aminoquinolines). The medicated salt distribution was not very effective in the past because of some operational failures to provide salt steadily. In French Guiana, however, salt distribution is being continued. In Guyana, medicated salt was provided only to the group of balata bleeders as a preventive measure.

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 1974
			Kind used	Years of coverage			Applied in 1973	Results obtained	
Colombia									
1 - Bajo Cauca	22 888	11 109	DDT	14	A. darlingi A. punctimac. A. nuñeztovari A. albimanus	Vector; poor housing colonization; social problems; parasite resist. to Chloroquine	MDT twice a month; Quarterly spray with DDT + BHC	Good	Weekly medication; sprayings
Uraba	95 782	3 850	"	12	"	"	"	"	"
Catatumbo	6 791	1 579	"	10	A. nuñeztovari A. punctimac.	Vector; poor housing colonization; parasite resistance to Chloroquine	"	"	To continue MDT; health education; spraying
Sarare	23 876	12 235	"	8	A. nuñeztovari A. neivae A. darlingi A. punctimac.	"	Fortnightly and weekly MDT; Sem. spraying with DDT and BHC	Unsatisfactory	"
Central Pacific litoral	154 034	28 734	"	12	A. neivae A. albimanus	Vector; poor housing difficult operations	Semestrial spray. with DDT	No changes	Entomological studies; health educ.; spraying
Magdalena Medio	192 621	21 544	"	8	A. nuñeztovari A. darlingi A. punctimac. A. albimanus	Social problems; vector; poor housing; parasite resistance to Chloroquine	Semestrial spraying with DDT; weekly medication	"	To improve spraying and medication coverage
Alto Territorio Vásquez	7 588	529	"	10	A. darlingi A. punctimac.	Colonization	Semestrial spraying with DDT	"	"
Ariari	50 378	26 786	"	8	A. nuñeztovari A. darlingi A. punctimac.	Refusal, poor housing	Health education; fortnightly MDT; semestrial spraying	Good	To continue same measures

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 km²	Insecticida		Principal vector	Causes of problem	Attack measures		Measures planned for 1974
			Kind used	Years of coverage			Applied in 1973	Results obtained	
Colombia (Cont.)									
Alto Caquetá	51 629	25 570	DDT	10	A. darlingi A. punctimac.	Colonization	Weekly and fortnightly medication; semest. spraying	No changes	Mass drug treatment; entomological studies; spraying
Total	605 587	131 936							
Ecuador									
2 - Esmeraldas	220 000	8 344	DDT	6	A. punctimac. A. albimanus	Colonization; poor housing	Weekly spraying with DDT	Transmission decreased	Semestrial spraying with DDT and intercycle sprayings
Napo	43 735	32 239	"	"	"	"	"	Deterioration of the malaria situation	Semestrial spraying with DDT and fortnightly treatment to 6,000 inhabitants
Total	263 735	40 583							
El Salvador									
3 - Coastal area	864 762	7 689	DDT Propoxur	16 3	A. albimanus	Vector resistance	Spraying with Propoxur	No changes	To continue Propoxur sprayings
Guatemala									
4 - Southern coast	300 358	5 997	Propoxur	3	A. albimanus	Resistance to DDT	Spraying with Propoxur	Good	Same as in 1973
Nueva Concepción	31 533	442	"	"	"	Resistance to DDT and Propoxur	Radical cure treatment (resistance encountered in Nov. 1973)	In observation	Usage of drugs and other measures
Total	331 891	6 439							

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 km²	Insecticide		Principal vector	Causes of problem	Attack measures		Measures planned for 1974
			Kind used	Years of coverage			Applied in 1973	Results obtained	
Haiti									
5 - Cité Simone O. Duvalier	19 394	2.8	DDT	5	A. albimanus	Vector resistance	Drainage and larvicides	Cood	Same as in 1973
Jacmel	5 519	-	"	11	"	"	-	-	Usage of other Insect.
Cayes-Jacmel	2 060	-	"	"	"	Migrations; inadequate coverage	Mass drug Treat.	-	"
Valle de la Coma	11 584	-	"	"	"	Migrations	Spraying	-	"
Gross-Morne	14 042	-	"	10	"	Vector resistance	-	-	"
Petit-Goave	32 901	-	"	12	"	Migrations	ULV sprayings	-	"
Total	85 500								
Honduras									
6 - Area Sur Valle de Jamastran Valles de Talanga y Cedros	204 486	5 436	DDT DLN MAL	6 1 1 1/2	A. albimanus A. pseudopunct.	Resistance to DDT and DLN; internal and external migration of the population	Spraying with Propoxur	Very satisfactory	Quarterly sprayings with Propoxur
Mexico									
7 - Basins of Rivers Fuerte, Sinaloa, Humaya and Tamazola	420 600	20 411	DDT DLN	16[a]	A. pseudopunct. A. albimanus	Internal migration; incipient resistance; poor housing; agressions of sprayed surfaces	Semestrial spray. with DDT; treatment of cases and collaterals by spraying personnel	Transmission persists	Same as in 1973. no new measures to be applied

a) Irregular cycles and dosifications; in 1968 and 1969 only one spraying cycle was carried-out due to financial problems.

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 1974
			Kind used	Years of coverage			Applied in 1972	Results obtained	
Mexico (Cont.)									
8- Huicot	109 119	27 323	DDT DLN	16[a]	A. pseudopunct.	Population movement; poor housing; agressions of sprayed surfaces; temporary shelters	Semestrial spray. with DDT; treatment of cases and collaterals by spraying personnel	Transmission persists	Same as in 1973. No new measures to be applied
9 - Basin of Balsas River	2 452 672	70 785	"	"	A. pseudopunct. A. albimanus	Aggres. of sprayed surfaces; intensive population movement; poor housing; partial resist. of A. pseudop.	"	Transmission decreased	"
10 - "Costa Chica" of Guerrero and Oaxaca coastal	585 916	34 064	"	"	"	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 collater. in positive localities; field research on P. falciparum resistance	Transmission of P. falciparum decreased and also P. vivax cases decreased.	Same as in 1973. No new measures have been planned
11 - Northeastern slope of the Golf of Mexico Oaxaca State	195 721	16 612	"	"	"	Internal population movement; poor housing; aggress. of sprayed surfaces	Semestrial spraying with DDT; radical cure treatment by spraying personnel	Transmission decreased	"
12 - Tapachula-Suchiate	267 634	4 443	"	"	"	Partial resistance of A. albimanus to DDT migration movements	"	"	"
13 - Central part of Chiapas State	196 869	5 448	"	"	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	"
Total	4 228 531	179 086							

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 1974
			Kind used	Years of coverage			Applied in 1973	Results obtained	
Nicaragua									
14 - Pacific Region Departments Chinandega, Leon, Managua, Carazo, Masaya, Granada and Rivas	1 007 476	16 023	DDT MAL Propoxur	4 4 3 3/4	A. albimanus	Vector resistance to DDT and Malathion	Quarterly spray. with Propoxur, 4 cycles a year	Very favorable	Quarterly cycles with Propoxur; (4 times a year)
15 - Central Region Dpts.: Nueva Segovia, Madriz, Estelí, Matagalpa, Boaco Chontales	331 274	11 208	DDT MAL Propoxur	4 5 3 1/2	"	"	"	"	"
16 - Atlantic Region Zelaya Department (El Rama municipality)	25 900	150	DDT MAL Propoxur	4 1 3 1/2	"	Vector resistance to DDT	Quarterly spray. with Propoxur, 4 cycles a year	"	"
Total	1 364 650	27 381							
Panama									
17 - Lago Gatún	1 360	51	DDT	11	A. albimanus	Vector and parasite resistance	Spraying with Propoxur; usage of alternative drugs	Satisfactory	Same as in 1973
Transismica and Portobelo	3 528	211	"	"	"	"	"	"	"
Jaqué	3 278	1 496	"	12	"	Poor housing	Spraying with Propoxur	In observation	"
Garachiné-Sambú	3 870	1 412	"	"	"	Vector resistance	"	"	"
Chinina (Chepo)	1 430	455	"	"	"	"	"	"	"
Total	13 466	3 625							

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 1974
			Kind used	Years of coverage			Applied in 1973	Results obtained	
Venezuela									
18 - Occidental area	407 418	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
19 - Southern area	80 269	120 208	"	"	A. darlingi	"	Intradomiciliary spraying with DDT; deposit of drugs in houses; radical cure to P. falcip. infections	"	"
Total	487 687	139 946							

GEOGRAPHICAL DISTRIBUTION OF AREAS WITH TECHNICAL PROBLEMS
(SHOWN IN TABLE No. 23)

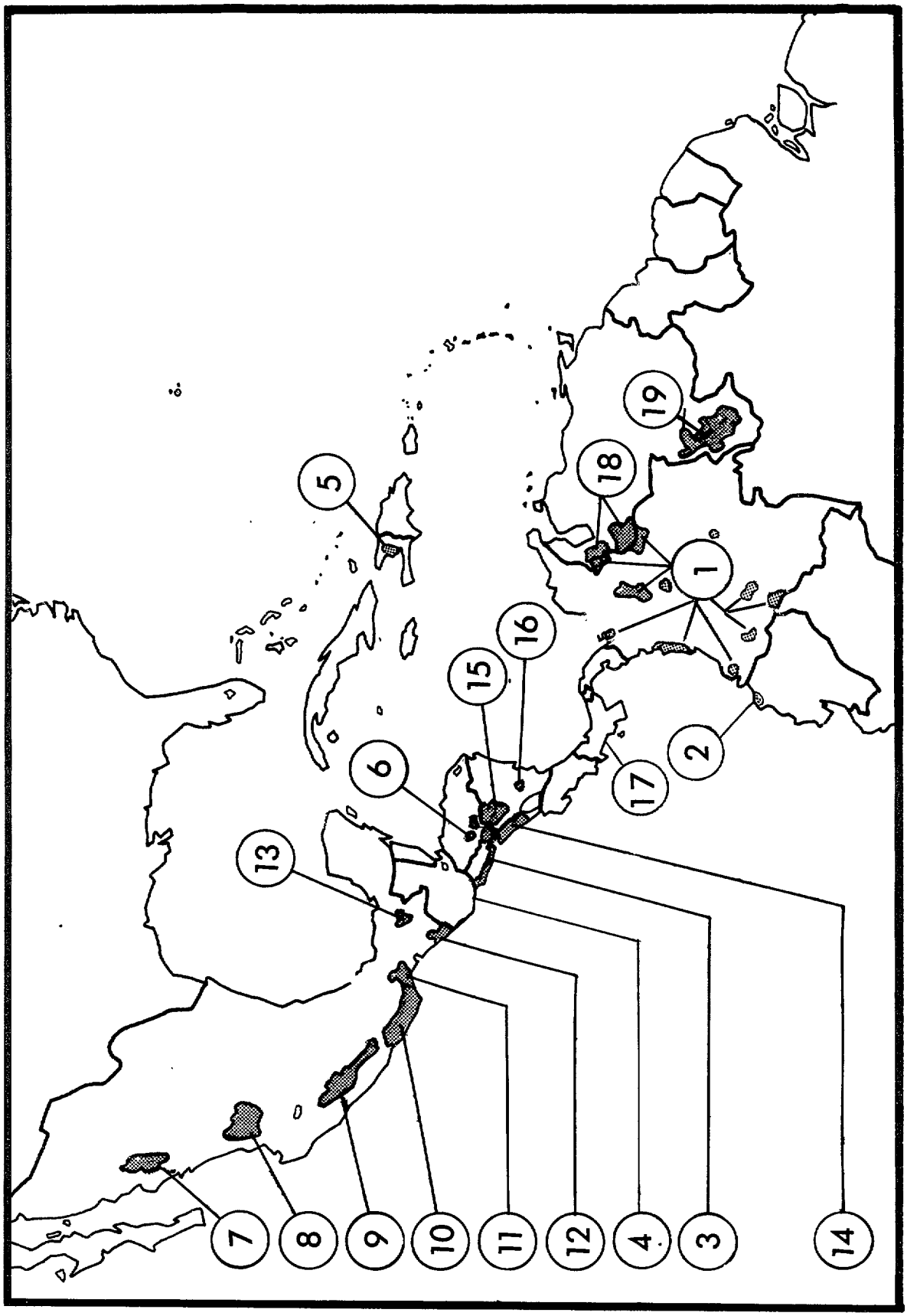


Table 24

MASS DRUG PROGRAMS IN THE AMERICAS, 31 DECEMBER 1973

Country and name of area	Population	Area Km^2	Drug used	Drug cycle	Number of cycles 31 Dec. 1973	Population treated (percentage)	Slides examined	Positive cases		
								P. falciparum	P. vivax	Total
Colombia										
Catatumbo	1 966	280		Weekly	8	69.7	368	17	2	19
Sarare	3 531	430		"	8	58.0	283	7	10	17
Sarare	7 391	900		14 days	65	61.8	693	53	103	156
Urabá	65 823	6 900	Chloroquine	Weekly	48	69.5	3 770	526	95	621
Ariari	17 864	9 000	+Primaquine	14 days	9	76.8	151	20	10	30
Putumayo - Alto Caqueta	4 169	580	+Pyrimetha-	Weekly	8	57.9	326	10	-	10
Putumayo - Alto Caqueta	11 663	3 400	mine	14 days	42	68.4	298	17	33	50
Bajo Cauca	16 311	2 800		"	-	66.8	1 288	155	78	233
Rio Ermitaño Carare	2 235	389		Weekly	32	51.6	455	24	16	40
Total	130 953	24 679								
Guatemala										
Coban, A. V. Sector 7-3	3 617	160		28 days	11	97.4	1 555	-	21	21
Zona Sebol, A. V. Sector 7-4	12 853	310	Chloroquine[a]	14 days	23	82.4	5 262	-	61	61
Panzos, A. V. Sector 8-1	17 130	300	+Primaquine	28 days	12	80.2	4 339	-	65	65
Total	33 600	770								
Haiti										
Aquin-Cayes	409 082	...	Chloroquine[b] Pyrimetham.	21 days	...	77.2	10 284	222	-	222

a) Combined drug, infant and adult size. b) Starting June, only Chloroquine was administered. c) Information up to November 1973.

Table 24 (Cont.)

MASS DRUG PROGRAMS IN THE AMERICAS, 31 DECEMBER 1973 (Cont.)

Country and name of area	Population	Area Km^2	Drug used	Drug cycle	Number of cycles 31 Dec. 1973	Population treated (percentage)	Slides examined	Positive cases		
								P. falciparum	P. vivax	Total
Peru										
Amazonas	1 062	100	Chloroquine		3	57.6	106	-	20	20
Irituyacu	538	200	+ Primaquine	Monthly	3	93.8	358	-	138	138
Chipillico	1 571	20	+ Pirimetamine		3	65.2	869	-	135	135
Total	3 171	320								
French Guiana										
Matoury	567	...				...	1 045	29	-	29
Macouria	384	...				...	462	14	-	14
Sinnamary	1 913	...				...	2 067	53	-	53
Iracoubo	1 196	...	Chloroquine			...	975	56	-	56
Roura	393	...	+ Primaquine	Quarterly	4	...	171	12	-	12
Oyapock	1 200	...				...	765	1	-	1
Maroni	1 500	...				...	684	41	-	41
Total	7 153	...								

... No information available.

IV. RESEARCH

The Organization continues to support operational research projects on possible attack measures which appear promising for the solution of field problems. However, the extent of the technical problems hindering the progress of the programs requires increasing efforts in the epidemiological study of those problems. At the same time, the promising results obtained by some research workers on basic problems has made it necessary for the Organization to give additional support to those aspects which appear to afford a good likelihood of practical application.

Activities carried out during the year included:

A. Evaluation of Insecticides

1. Propoxur

In 1973, efforts were continued to evaluate propoxur for the control of malaria transmitted by A. albimanus resistent to DDT, dieldrin and various organophosphorous insecticides in Central America. The significant decline in the malariometric indices continued in the areas treated along the Pacific coast, except in the area of propoxur resistance, which extends to most of the coastal plains of El Salvador.

Studies were continued on the factors influencing the residual effect, especially the pH of the surfaces sprayed in relation to the insecticide formulation.

2. Landrin

This insecticide was considered a possible solution to the problems of propoxur resistance in El Salvador in view of the success obtained in field studies (stage V) carried out in Nigeria and the low-cross resistance between the two insecticides, confirmed in the laboratory of the University of California and in the field in El Salvador by experiments carried out by the Central American Malaria Research Station of the United States Center for Disease Control.

Field studies were made to compare the effects of the insecticide on A. albimanus populations that were susceptible and resistant to propoxur. Since the development of propoxur resistance appears to have followed two different routes in El Salvador, three localities were selected for treatment with landrin. One was a cotton growing locality where propoxur resistance developed apparently because of previous selection by parathion and other organophosphorous insecticides used in agriculture, followed by the use of propoxur for antimalarial purposes. The second is located in a rice cultivation area where resistance was associated with the prior use of carbaryl and other carbamates for crop protection, and its development probably preceded the antimalarial use of propoxur. The third was a locality in which A. albimanus was susceptible to propoxur. For each of these three localities, a neighboring locality with similar characteristics was selected for comparative observations without treatment with landrin.

The results obtained during the 1973 transmission season confirmed the high efficiency of landrin in areas where A. albimanus is susceptible to propoxur and its lower efficiency in propoxur-resistant areas where the knock-down effect of landrin was almost completely lost, even though high mortalities continued to be obtained after a 24-hour observation period. No differences were observed between the two propoxur-resistant areas.

These results show that landrin may be a good attack measure in propoxur-susceptible areas and could perhaps provide a useful control in propoxur-resistant areas, although the duration of effectiveness in these areas may perhaps be limited.

Plans were made for a large-scale trial (stage VI-VII) of this insecticide but unfortunately the manufacture of landrin was suspended in late 1973 because of the oil crisis. Consequently, these trials had to be postponed.

3. Other Insecticides

Preliminary trials were carried out on the effectiveness of other insecticides on local A. albimanus in El Salvador. So far Fenthion (OMS-2) and Actellic (OMS-1424) have been tested, and plans have been made for large-scale trials of Methyl Dursban against Aedes aegypti and A. albimanus.

B. Chemotherapy

In vivo and in vitro studies were continued to determine the distribution of P. falciparum strains resistant to the 4 aminoquinolines in Colombia, Surinam, and Panama.

In Colombia, an epidemiological study was begun on the evolution and possible dispersion of drug resistant P. faciparum strains.

C. Immunological Studies

The Organization continued and increased its contribution to the financial support of research designed to develop a method of active immunization against malaria, which is being conducted by the Department of Preventive Medicine of New York University, and supported their collaboration with the Department of International Medicine of the University of Maryland, which is extending the testing of this technique to human volunteers.

These studies have already resulted in the active immunization of persons by bites of irradiated infected mosquitos, thus demonstrating the possibility of the phenomenon. Research is being increased on the identification, selection and purification of the most active antigens and practical routes of administration, the solution of production problems, in particular the development of an in vitro method of cultivating sporozoites and the study of the mechanism of the immune response and the effects and possible use of adjuvants.

The Organization also provided a fellow from the University of Belo Horizonte in Brazil to work on this research at New York University for two years, at the end of which she can continue research on malaria immunology upon return to her country.

D. Serological Studies

Assistance was given to the Malaria Eradication Service of Costa Rica in establishing a laboratory for the serological diagnosis of malaria in San José. That laboratory initiated research on the use of serological techniques in the evaluation of malaria eradication campaigns and epidemiological surveillance of that disease.

In collaboration with the Malaria Eradication Service of Guyana and the United States Public Health Service Center for Disease Control, a sero-epidemiological survey was conducted in the interior of Guyana for the purpose of confirming the alleged eradication of malaria from the greater part of that country.

At the same time, serological specimens were collected in and around the foci of transmission in the area in the consolidation phase in the west of the country on the Brazilian border, with a view to better defining the use of these techniques in malaria surveillance.

E. Entomological Studies

Studies were continued on the susceptibility of vectors to insecticides and on variations in the behavior of vectors that may affect their contact with insecticides applied inside houses.

In collaboration with the Department of Entomology of the University of California (Riverside) studies are continuing on the mechanisms of A. albimanus resistance to insecticides and on the spectrum of cross resistance to other insecticides obtained by selection with one of them. The results of these studies are being used as a guide in field trials of insecticides in Central America.

In collaboration with the Department of Zoology of the University of Illinois, genetic studies of South American vectors were continued in Colombia and Brazil and the difference between the A. nuñeztovari of the two countries was confirmed. Studies were initiated on the colonization of possible members of this complex of species with a view to their genetic study.

F. Research on Economic Effects of Malaria

With the completion of field studies in Paraguay and the assembly of extremely varied information on a multitude of economic factors and indicators for studying the impact of malaria on the microeconomy, the information collected is being analyzed at Headquarters.

V. INTERNATIONAL COOPERATION

PAHO/WHO continued to provide technical assistance, fellowships, antimalarial drugs, equipment and supplies for entomological studies, mailing tubes for shipping blood slides and a few vehicles for training and special studies.

a. Technical assistance: Through the assignment of full-time professional and technical personnel and short-term consultants at the Country, Zone and Headquarters levels (Table 25).

b. Fellowships: Arrangement of six fellowships to receive training in malaria eradication at "Escuela de Malariología y Saneamiento Ambiental" (School of Malariology and Environmental Sanitation) in Maracay, Venezuela, four being granted fellowships by the Government of Venezuela and two by PAHO.

c. Antimalarial drugs: PAHO has been providing antimalarial drugs for presumptive and radical cure treatments. The amount and type of drugs provided to each country during 1973 and the accumulated quantity previously supplied since 1958 are given in Table 26.

d. Supplies, equipment and vehicles: Within the limitation of funds, PAHO has been providing only the essential material and equipment needed for entomological studies and other research activities. Mailing tubes for shipping blood slides and some limited amount of laboratory supplies have been provided occasionally. A few vehicles for training and some special activities in case of emergency have also been purchased.

The United States Agency for International Development (AID) continued to make grant to one country, but terminated its assistance in loans in 1973.

The Government of the Federal Republic of Germany donated 248,000 kilograms of propoxur to four countries in Central America during the year.

The United Nations Development Programme (UNDP) allotted funds for the employment of an Epidemiologist for Panama.

Table 27 shows the contribution of PAHO, WHO and AID to the programs for 1973 and estimates for 1974.

Table 25

PAHO/WHO FULL-TIME PROFESSIONAL AND TECHNICAL STAFF ASSIGNED TO COUNTRY, INTER-COUNTRY, AND INTER-ZONE MALARIA ERADICATION PROGRAMS IN THE AMERICAS, FROM 1971 TO JUNE 1974*

Country or other political or administrative unit	Medical Officers				Sanitary Engineers				Sanitary Inspectors				Entomologists				Others			
	1971	1972	1973	1974	1971	1972	1973	1974	1971	1972	1973	1974	1971	1972	1973	1974	1971	1972	1973	1974
Bolivia	1	1	1	1	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Brazil	4	4	4	4	1	1	2	1	3	1	-	1	1	1	1	-	1	-	-	1[a]
Colombia	1	1	1	1	-	-	-	-	1	3	3	2	-	-	-	1	-	-	-	-
Costa Rica	1	1	1	2	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Dominican Republic	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	1	1	1	1	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-
El Salvador	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-
Guatemala	1	1	1	1	1	1	1	1	1	-	-	1	-	-	-	1	-	-	-	-
Haiti	1	2	2	2	1	-	-	-	2	1	1	1	-	-	-	-	-	-	-	-
Honduras	1	1	1	1	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Mexico	1	1	1	1	1	1	1	1	-	-	-	1	1	1	1	-	-	-	-	-
Nicaragua	2	2	2	1	-	-	-	-	2	2	1	1	-	-	1	-	-	-	-	-
Panama	2	2	1	-	1	1	1	1	1	1	-	1	-	-	-	-	-	-	-	--
Paraguay	1	1	1	1	1	1	1	-	1	1	1	-	-	-	-	-	-	-	-	-
Peru	1	1	1	1	1	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-
Belize	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Surinam	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-
ME Dept., Inter-zone or inter-country projects	12	11	11	7	1	1	1	1	2	2	2	2	2	3	2	2	4[b]	4[b]	5[c]	1[d]
Total	33	32	31	25	9	8	9	6	20	18	14	15	5	6	6	5	5	4	5	2

* From 1971 to 1973 as of 31 December of each year; 1974 up to June.

a) Laboratory technician. b) One economist, two administrative officers and one laboratory technician. c) One economist, one statistician, two administrative officers, and one laboratory technician. d) Economist.

Table 26

DRUGS PROVIDED BY PAHO/WHO TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1958-1973

(In thousands of tablets)

Country or other political or administrative unit	Total 1958-1972[a]								1973					
	Chloroquine 150 mg.	Primaquine		Pyrimethamine 25 mg.	Combined drug[b]	Aspirin		Fanasil	Chloroquine 150 mg.	Primaquine		Pyrimethamine 25 mg.	Combined drug[b]	Fanasil
		15 gm.	5 mg.			0.50 g.	0.20 g.			15 mg.	5 mg.			
Argentina	1 888	356	207	712	-	-	-	-	130	43	15	-	-[c]	-
Bolivia	8 800	1 255	631	856	462	200	-	9	620	120	60	-	108[c]	3
Brazil	120 735	2 014	975	240	1 879	-	-	172	8 800	100	50	25	240[d]	30
Colombia	29 895	2 503	830	5 149	9 592	100	20	26	1 500	100	-	1 500	2 000[e]	150
Costa Rica	6 194	993	417	213	1 385	227	81	-	500	110	40	-	-	-
Cuba	4 350	38	69	80	-	-	-	-	-	.	-	-	-	-
Dominican Republic	13 030	83	222	847	150	10	10	-	1 200	8	3	-	156[c]	-
Ecuador	13 136	1 016	240	430	845	-	-	-	1 300	100	21	-	168[c]	-
El Salvador	18 205	928	902	128	2 070	-	-	-	1 000	-	-	-	-	-
Guatemala	16 461	1 187	239	77	8 049	200	50	2	1 472	105	102	50	-	-
Guyana	787	268	98	338	-	30	-	25	200	1	1	-	-	-
Haiti	6 370	82	-	1 480	31 608	-	.	-	5 300	20	5	-	-	.
Honduras	13 945	1 584	1 235	88	1 290	-	-	-	864	-	-	-	-	.
Jamaica	379	18	-	288	50	-	-	-	-	.	-	-	-	-
Mexico	75 916	10 636	15 372	10 679	4 432	-	.	-	4 000	-	-	-	-	-
Nicaragua	10 999	1 548	2 155	156	6 933	-	-	-	1 210	850	-	-	-	-
Panama	6 540	1 024	473	342	1 705	-	-	20	-	22	10	120	82[e]	5
Paraguay	10 712	256	118	68	76	-	-	8	900	-	-	-	-[f]	-
Peru	24 456	1 389	648	2 267	3 405	433	40	-	600	200	60	510	684	-
Trinidad and Tobago	815	940	419	121	400	112	20	-	-	-	-	-	-	-
Belize	490	41	37	6	22	61	79	-	36	14	50	-	-	-
Canal Zone	-	-	-	-	90	-	-	-	-	-	-	-	-	-
Dominica	90	1	1	45	-	40	-	-	-	-	-	-	-	-
French Guiana[g]	160	21	20	16	48	-	-	-	168	82	27	20	-	
Grenada	43	-	-	45	-	20	-	-	-	-	-	-	-	-
St. Lucia	68	1	-	70	-	36	-	-	-	-	-	-	-	-
Surinam[h]	2 211	74	66	586	265	128	10	5	594	125	7	300	-	-
Total	387 175	28 256	25 374	25 327	74 756	1 597	310	267	30 394	2 000	451	2 525	3 438	188

a) Chloroquine, Primaquine and Pyrimethamine powder and Tricalcium phosphate have been provided to different projects. b) Chloroquine/Primaquine (adult and infant size). c) Adult size,drugs donated by the NMES of Nicaragua. d) 180,000 Tbs. adult size donated NMES of Nicaragua and 60,000 Tbs. infant size donated by the NMES of El Salvador. e) Infant size tablets donated by the NMES of Nicaragua. f) 600,000 Tbs. adult size and 84 infant size donated by the NMES of Nicaragua.
g) In addition there were also provided 600 Lbs. Amodiaquine powder and 300 Lbs. Tricalcium phosphate. h) There were also provided 2,700 Lbs. Amodiaquine powder and 1,300 Lbs. Tricalcium phosphate.

Table 27

INTERNATIONAL CONTRIBUTIONS TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS
1973 AND ESTIMATED 1974

(U.S. dollars)

Country or other political or administrative unit	Date of initiation of total coverage	1973			1974 (estimated)		
		PAHO	WHO and WHO/TA	AID (USA) (fiscal year) a)	PAHO	WHO and WHO/TA	AID (USA) (fiscal year) a)
Argentina	Aug. 1959	1 836	-	-	7 000	-	-
Bolivia	Sep. 1958	66 768	-	-	53 500	-	-
Brazil	Aug. 1959	210 330	46 030	-	207 800	50 000	-
Colombia	Sep. 1958	91 173	-	-	118 300	-	-
Costa Rica	Jul. 1957	-	26 371	-	28 600	33 900	-
Dominican Republic	Jun. 1958	36 503	-	-	15 000	-	-
Ecuador	Mar. 1957	55 968	-	-	50 500	-	-
El Salvador	Jul. 1956	31 782	87 309	-	37 100	77 100	-
Guatemala	Aug. 1956	30 345	33 982	-	88 700	32 500	-
Guyana	Jan. 1947	2 495	-	-	1 800	-	-
Haiti	Jan. 1962	90 837	-	1 200 000	82 900	-	1 500 000
Honduras	Jul. 1959	-	55 196	-	-	59 300	-
Mexico	Jan. 1957	25 209	110 282	-	89 700	40 000	-
Nicaragua	Nov. 1958	52 356	63 954	-	21 100	26 159	-
Panama	Aug. 1957	23 549	29 154	-	21 100	49 500	-
Paraguay	Oct. 1957	77 746	-	-	33 100	-	-
Peru	Nov. 1957	56 198	-	-	60 200	-	-
Belize	Feb. 1957	21 583	-	-	22 200	-	-
French Guiana	Sep. 1963	9 682	-	-	5 000	-	-
Surinam	May 1958	-	61 670	-	-	37 100	-
Inter-country projects and general services		476 692	384 884	-	283 350	418 260	-
Total		1 361 052	898 832	1 200 000	1 226 950	823 819	1 500 000

a) AID loans are shown in Table 21