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STATUS OF MALARIA ERADICATION IN THE AMERICAS

XVII REPORT

TABLE OF CONTENTS

	<u>Page</u>
Introduction	1
I. STATUS OF MALARIA ERADICATION PROGRAMS	
A. General picture	1
B. Current extent of the problem	5
C. Field operations	12
D. Budget	20
II. SPECIAL TECHNICAL PROBLEMS	
A. General status	108
B. Activities for solving technical problems	108
1. Use of alternative insecticides	108
2. Larviciding	108
3. Additional cycle of DDT	108
4. Mass drug distribution	109
5. Intensified case-detection and radical-cure treatment	109
III. RESEARCH	
A. Evaluation of new insecticide	115
B. Investigations in chemotherapy	115
1. Long-action malaria drugs	115
2. Liquid preparations	115
3. Use of primaquine-pyrimethamine in collective treatment	117
4. Response of <u>P. falciparum</u> to chloroquine and other drugs	117
5. Radical-cure treatments for <u>P. vivax</u>	117
C. Investigation of the economic effects of malaria	118
IV. INTERNATIONAL COOPERATION	118

FIGURES, MAPS AND TABLES

<u>Figures:</u>	<u>Page</u>
1 Number of cases of malaria in the countries of Central America, 1961-1968	11
2 Collective treatment programs with antimalarial drugs, Costa Rica and El Salvador	112
3 Collective treatment programs with antimalarial drugs, Honduras	113
4 Collective treatment programs with antimalarial drugs, Guatemala and Nicaragua	114
5 Malaria trends in the OMS-33 sprayed area in El Salvador, before and after spraying, 1964-1968	116
 <u>Maps:</u>	
1 Status of the malaria eradication program in the Americas, 31 December 1967	2
2 Status of the malaria eradication program in the Americas, 31 December 1968	3
 <u>Tables:</u>	
1 Comparison of 1967 and 1968 population and area by phase in countries with programs active after 1955, and change in per cent	4
2 Population of the Americas in areas in maintenance and consolidation phases, by year, 1960-1968, and annual per cent of increase	5
3 Epidemiological evaluation in areas under maintenance phase in malaria eradication programs, 1968	6
4 Epidemiological evaluation in areas in consolidation phase in malaria eradication programs, 1968	7
5 Status of malaria eradication in the Americas, by population, 1968 ...	8
6 Status of malaria eradication in the Americas, by area, 1968	9
7 Personnel employed in malaria eradication programs in the Americas, 31 December 1967 and 1968, by category	13
8 Personnel employed in spraying operations in malaria eradication programs in the Americas - 31 December 1968	14
9 Personnel employed in epidemiological evaluation operations in malaria eradication programs in the Americas - 31 December 1968 ...	15
10 Personnel employed in administrative and other services in malaria eradication programs in the Americas - 31 December 1968	16
11 Personnel employed in transport services in malaria eradication programs in the Americas - 31 December 1968	17
12 Means of transport in malaria eradication programs in the Americas, 1968	18

<u>Tables: (Cont.)</u>	<u>Page</u>
13 Summary of case detection in the Americas, 1958-1968	19
14 Comparative results of active and passive case detection in malaria eradication programs in the Americas, 1968	21
15 National expenditures, 1967-1968 and budget 1969 for malaria eradication in the Americas	22
16 Estimated requirements for malaria eradication in the Americas	23
17 Mass drug programs in the Americas, 31 December 1968	110
18 PAHO/WHO full-time professional and technical staff assigned to country, inter-country and inter-zone malaria eradication programs in the Americas, 1958-1968	119
19 Drugs provided by PAHO to malaria eradication programs in the Americas, 1958-1968.....	120
20 International contributions to malaria eradication programs in the Americas, 1968 and estimated 1969	122

Country tables showing the status of the malaria eradication programs at December 1968

Argentina	24
Bolivia	28
Brazil	31
Colombia	36
Costa Rica	39
Cuba	42
Dominican Republic	45
Ecuador	48
El Salvador	51
Guatemala	54
Guyana	57
Haiti	60
Honduras	63
Jamaica	66
Mexico	68
Nicaragua	71

<u>Country tables: (Cont.)</u>	<u>Page</u>
Panama	74
Paraguay	77
Peru	80
Trinidad and Tobago	84
Venezuela	86
British Honduras	90
Dominica	92
French Guiana	94
Grenada and Carriacou	97
Guadeloupe	99
Panama Canal Zone	101
St. Lucia	103
Surinam	105

REPORT ON THE STATUS OF MALARIA ERADICATION IN THE AMERICAS

XVII REPORT

Introduction

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

The report has four chapters. The first chapter contains information and discussion of the status of the program in general, numerical and graphical country-by-country presentations showing the history and present condition of each program. The second chapter relates to special technical problems which have arisen and the measures which are being applied to overcome them. Research currently in progress is treated in the third chapter. The last chapter concerns with international cooperation in malaria eradication programs.

Data presented in this report are taken from answers received from each country to a detailed annual questionnaire, and from periodic statistical reports submitted to the Pan American Sanitary Bureau by most of the programs, supplemented by data from plans of operation and from special technical reports concerning research projects.

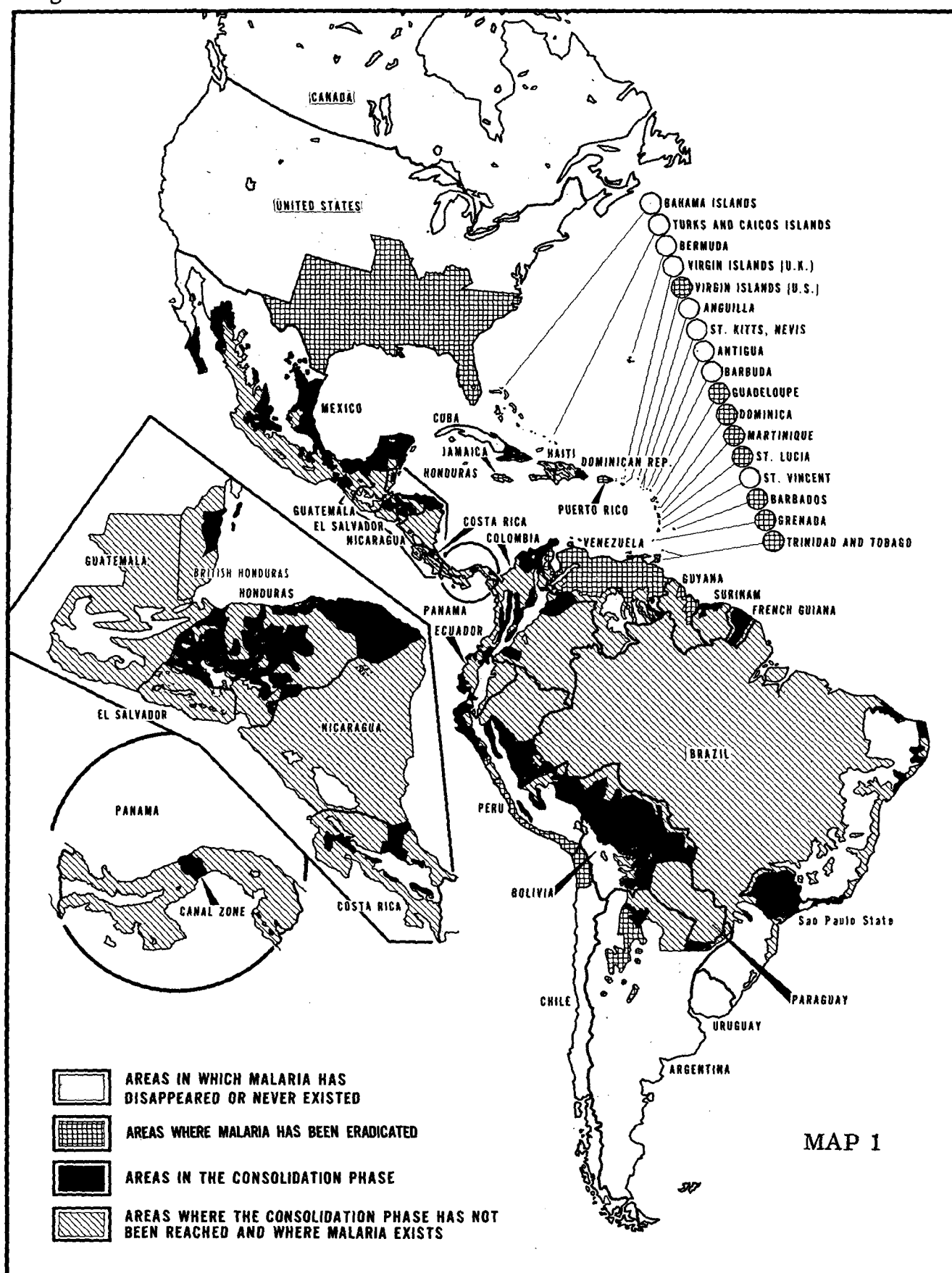
I. STATUS OF MALARIA ERADICATION PROGRAMS

A. General Picture

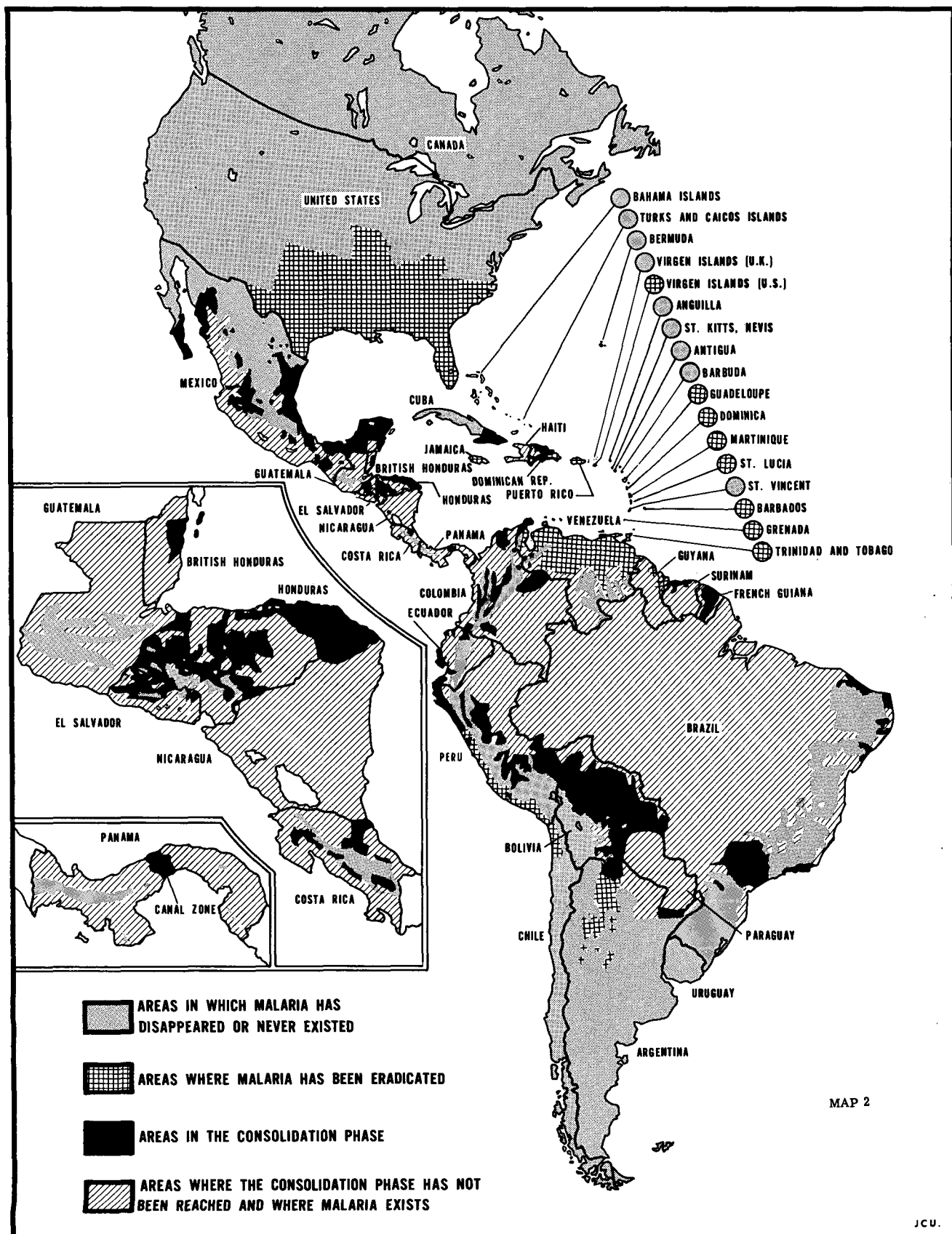
Of the 484,600,000 inhabitants that constitute the population of the Americas, 174,704,000 (36%) live in the originally malarious areas. Of the latter, 118,247,000 (67.7%) reside in the areas in consolidation and maintenance phases, leaving 56,234,000 persons (32.2%) still exposed to this disease in the area in attack phase. Because of the difficulties in access to their places of residence, 217,000 persons (0.1%) continue to have no protection at all from malaria infection.

Considering the Continent by its sub-regions, North America is entirely in maintenance phase. In Middle America, 56% of the population living in the originally malarious area is now in consolidation and maintenance phases, and 44% in attack phase. In South America, one half of the population in the originally malarious area now live in areas in consolidation and maintenance phases and the other half in area in attack phase. The changes observed since 1967 have been favorable: 4,200,000 inhabitants were freed from the risk of infection and their area of residence was passed from attack to consolidation phase, and in 1968, for the first time, the entire originally malarious area was brought under attack phase with the application of attack measures, except for the area of 47,000 km² with 217,000 inhabitants as previously mentioned.

The changes which have taken place in over-all position during 1968 can be seen by comparison of Maps 1 and 2. Table 1 presents comparative figures of population and area by phase of program for 1967 and 1968, for all programs which have been active since the beginning of the hemisphere-wide eradication campaign in 1955. The figures make it clear that the advances of the campaign were continued during 1968--the population living in maintenance areas increased slightly, while that in consolidation areas was considerably augmented, and that in attack areas include all population previously living in the preparatory phase areas. The decrease in area in consolidation phase results from changes in official estimates of the areas of given districts rather than from re-classification of actual territories, there having in fact been a slight net increase in areas in consolidation phase despite small areas reverted to attack in Brazil, Colombia and Venezuela. In Table 2 is shown the historical sequence for all countries of the Americas of the shifts of population into consolidation and maintenance phases.



STATUS OF THE MALARIA ERADICATION PROGRAM IN THE AMERICAS, 31 DECEMBER 1967.



STATUS OF THE MALARIA ERADICATION PROGRAM IN THE AMERICAS, 31 DECEMBER 1968

In 1968 the American malaria eradication programs passed a point of considerable historic interest -they achieved the state of having the population of practically all the originally malarious areas of the Americas under protection. The 3.3 million square kilometers which have been in preparatory phase in Brazil, and the whole malarious area of Paraguay which was also in this phase since 1961, were brought into attack phase in the latter part of the year, leaving no malarious areas without program activities, save tiny enclaves in Colombia in which it is temporarily impossible to work because of civil unrest.

Some of the areas in Argentina, Brazil, Cuba, Dominican Republic, and Peru were passed from attack phase to consolidation phase, and other areas in Argentina, Dominican Republic, and Peru from consolidation to maintenance phase.

Table 1

COMPARISON OF 1967 AND 1968 POPULATION AND AREA BY PHASE
IN COUNTRIES WITH PROGRAMS ACTIVE AFTER 1955, AND CHANGE IN PER CENT

Phase	1967	1968	Percentage change
A. <u>Population in thousands:</u>			
1. Malaria eradication claimed or registered	13 220	14 059	+ 6.3
2. Consolidation phase	41 581	45 812	+ 10.2
3. Attack phase.....	44 766	56 234	+ 25.6
4. Preparatory phase or not yet started.....	12 834	217	- 98.3
B. <u>Area in km²</u>			
1. Malaria eradication claimed or registered	828 832	720 832	- 13.0
2. Consolidation phase	2 162 540	2 112 056	- 2.3
3. Attack phase	6 599 251	10 444 843	+ 58.3
4. Preparatory phase or not yet started.....	3 742 054	47 000	- 98.7

Table 2

POPULATION OF THE AMERICAS IN AREAS IN MAINTENANCE AND CONSOLIDATION PHASES, BY YEAR, 1960-1968, AND ANNUAL PER CENT OF INCREASE

Year	Population in thousands			
	Malaria eradication claimed or achieved	Consolidation phase	Annual % of increase	
			Malaria eradication claimed	Consolidation phase
1960	50 741	1 991	-	-
1961	53 357	13 879	5.2	597.1
1962	55 397	25 914	3.8	86.7
1963	56 546	33 901	2.1	30.8
1964	57 414	32 277	1.5	- 4.8
1965	60 975	34 731	6.2	7.6
1966	69 760	36 128	14.4	4.0
1967	70 720	41 581	1.4	15.1
1968	72 441	45 806	2.4	10.2

B. Current Extent of the Problem

In analyzing the programs from technical, operational and administrative view points, it was considered that of the 113,222,000 persons living in the area with active malaria eradication campaign, exists the probability of achieving malaria eradication in very short period of time in 5%; with good prospects in 54%, with certain technical and operational problems in 17%, with serious administrative difficulties (although some of them being solved) in 13% and with very serious technical problems in the rest 11%. The progress of the campaign of the last group depends not only on adequate financial support, but also on complementary attack measures which may alter the current strategy completely. The greater part of this 11% corresponds to Central America.

In the area in maintenance phase, which spread over 13 political units, 2,868 malaria cases were found, of which 91.0% were from the United States of America. Only 33 cases were originated in the area. In Venezuela, the situation was considerably improved in comparison with that in previous years (See Table 3).

The area in consolidation phase includes 17 political units with a total area of 2,112,056 km² and a total population of 45,812,000. In this area, 20,202 malaria cases were found, giving an Annual Parasite Incidence (API) of 0.4 per 1,000 inhabitants. Considering the area by countries, 8 have an API of 0.5 or less, and 9 have more than 0.5 which indicates that some of the area in consolidation phase should not have been in this phase. El Salvador has an API of 8.5, and for this reason it was recommended to pass the area from consolidation phase to attack phase in 1969. (See Table 4).

Detailed figures of population and area by phase of program for each country and territory of the Americas are presented in Tables 5 and 6, and the main features of activities and results from the initiation of operations through 1968 are given for each active program in the country tables, to facilitate the proper interpretation of the current condition.

The campaign in Mexico continued during 1968 to operate at a level adequate only for maintaining the gains previously achieved. Some small outbreaks occurred in consolidation areas but on the whole the situation was maintained without deterioration. There is a good prospect that this program will receive financial support in 1969 enabling it to resume a level of activity aiming at eradication of the disease.

Table 3

EPIDEMIOLOGICAL EVALUATION IN AREAS UNDER MAINTENANCE PHASE IN MALARIA
ERADICATION PROGRAMAS, 1968

Country or other political unit	Number of slides examined	Total No. of positive cases	Species of parasite			Origin of infections						
			<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>	Autochthonous	Relapsing			Induced	Introduced	Unclassified or not investigated
								from abroad	from areas within country			
Argentina	103 958	35	-	35	-	27	-	-	7	-	-	1
Brazil	19 690 a)	10	-	10	-	-	-	-	10	-	-	-
Dominican Republic	55 007	3	2	1	-	-	1	2	-	-	-	-
Guyana	23 153	17	7	10	-	-	-	-	17	-	-	-
Jamaica	99 581	2	1	1	-	-	-	2	-	-	-	-
Peru	31 829	6	-	5	1	-	-	-	1	1	-	4
Trinidad and Tobago	65 757	5	4	-	1	-	1	4	-	-	-	-
United States of America b)	1 494 c)	2 610 d)	344	2 125	32	-	-	2 598	-	-	5	7
Venezuela	325 885	180	20	155	5	16	-	42	87	2	32	1
Dominica	5 197	-	-	-	-	-	-	-	-	-	-	-
Grenada and Carriacou	218	-	-	-	-	-	-	-	-	-	-	-
Guadeloupe	14 018	-	-	-	-	-	-	-	-	-	-	-
St. Lucia	6 771	-	-	-	-	-	-	-	-	-	-	-
Total	752 558	2 868 d)	378	2 342	39	43	2	2 648	122	3	37	13

a) Up to October.

b) Including Puerto Rico.

c) Includes only those slides examined at NCDC.

d) Including 8 cases P. ovale, 46 mixed infections and 55 without species diagnosed. Does not include 247 relapsing cases.

Table 4

EPIDEMIOLOGICAL EVALUATION IN AREAS IN CONSOLIDATION PHASE IN MALARIA
ERADICATION PROGRAMS, 1968

Country or other political unit	Population (thousands)	No. of slides examined	Total No. of positive cases	API Total (a)	API Total (b)	Species of parasite			Origin of infections						
						<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>	Autochthonous	Relapsing	Imported		Induced	Introduced	Unclassified or not investigated
											from abroad	from areas within country			
Argentina	423	75 300	126	0.3	0.2	-	126	-	101	-	8	6	-	-	11
Bolivia	1 245	89 639	828	0.7	0.4	184	644	-	499	13	7	52	-	-	257
Brazil (Excl. São Paulo) ..	5 926	537 347 ^{c)}	1 148 ^{c)}	0.2	0.04	591	556	1	261	11	4	542	3	17	310
Brazil (São Paulo)	5 152 ^{d)}	123 277	578	0.1	0.01	261	317	-	99	1	4	426	1	1	46
Colombia	7 803	381 362	2 464	0.3	0.05	1 166	1 294	4	419	5	22	1 609	2	14	393
Costa Rica	156	26 140	35	0.2	0.1	-	35	-	11	5	-	10	-	8	1
Cuba	2 734	834 107	4	0.0	-	-	4	-	-	-	4	-	-	-	-
Dominican Republic	3 321	386 692	1	0.0	-	-	-	1	-	1	-	-	-	-	-
Ecuador	1 376	151 392	4 660	3.4	0.1	318	4 342	-	190	3	-	1 369	-	8	3 090
El Salvador	505	112 640	4 305	8.5	1.0	55	4 250	-	487	592	47	773	-	-	2 406
Honduras	1 124	225 022	2 329	2.1	0.9	384	1 945	-	1 015	147	31	242	-	-	894
Mexico	13 574	988 165	3 554	0.3	0.1	4	3 535	15	2 128	407	3	380	15	8	613
Peru	2 184	85 336	34	0.01	0.0	1	31	2	10	6	1	9	1	-	7
British Honduras	48	1 581	-	0.0	-	-	-	-	-	-	-	-	-	-	-
French Guiana	13	5 117	22	1.7	0.3	16	6	-	4	-	8	10	-	-	-
Panama Canal Zone	50	22 367	89	1.8	1.4	5	84	-	70	8	10	-	-	-	1
Surinam	178	13 055	25	0.1	0.0	24	1	-	-	-	4	17	-	-	4
Total	45 812	4 058 539	20 202	0.4	0.1	3 009	17 170	23	5 294	1 199	153	5 445	22	56	8 033

a) Total number of cases founded in the area, by 1,000 inhabitants. b) Number of cases originated in the areas (autochthonous and introduced), by 1,000 inhabitants.

c) Up to October. d) 1967 figures.

Table 5

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY POPULATION, 1968
(Population in thousands)

Country or other political 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	23 040	2 943	12.8	1 631	55.4	423	14.4	889	30.2	-	-
Barbados	248 ^{a)}	248	100.0	248	100.0	-	-	-	-	-	-
Bolivia	4 700	1 491	31.7	-	-	1 245	83.5	246	16.5	-	-
Brazil	88 102	37 291	42.3	780	2.1	11 078	29.7	25 433	68.2	-	-
Canada	20 772 ^{b)}	-	-	-	-	-	-	-	-	-	-
Chile	9 351 ^{b)}	159 ^{a)}	1.7	159 ^{a)}	100.0	-	-	-	-	-	-
Colombia	20 131	11 222	55.7	-	-	7 803	69.5	3 202	28.5	217	2.0
Costa Rica	1 648	510	30.9	-	-	156	30.6	354	69.4	-	-
Cuba	8 074	2 734	33.9	-	-	2 734	100.0	-	-	-	-
Dominican Republic	4 029	3 995	99.2	208	5.2	3 321	83.1	466	11.7	-	-
Ecuador	5 417	2 941	54.3	-	-	1 376	46.8	1 565	53.2	-	-
El Salvador	3 215	2 180	67.8	-	-	505	23.2	1 675	76.8	-	-
Guatemala	4 858 ^{c)}	2 214	43.6	-	-	-	-	2 214	100.0	-	-
Guyana	702	702	100.0	658	93.7	-	-	44	6.3	-	-
Haiti	4 674	3 500	75.0	-	-	-	-	3 500	100.0	-	-
Honduras	2 325	2 029	87.3	-	-	1 124	55.4	905	44.6	-	-
Jamaica	1 913	1 530	80.0	1 530 ^{d)}	100.0	-	-	-	-	-	-
Mexico	45 176	22 398	49.6	-	-	13 574	60.6	8 824	39.4	-	-
Nicaragua	1 818	1 818	100.0	-	-	-	-	1 818	100.0	-	-
Panama	1 372	1 317	96.0	-	-	-	-	1 317	100.0	-	-
Paraguay	2 331	2 101	90.1	-	-	-	-	2 101	100.0	-	-
Peru	12 778	4 460	34.9	1 112	25.0	2 184	49.0	1 164	26.0	-	-
Trinidad and Tobago	1 036	885	85.4	885 ^{d)}	100.0	-	-	-	-	-	-
United States	199 861 ^{e)}	55 549	27.8	55 549	100.0	-	-	-	-	-	-
Uruguay	2 818	-	-	-	-	-	-	-	-	-	-
Venezuela	9 307	6 933	74.5	6 545 ^{f)}	94.4	-	-	388	5.6	-	-
Antigua	61 ^{a)}	-	-	-	-	-	-	-	-	-	-
Bahamas	144 ^{a)}	-	-	-	-	-	-	-	-	-	-
Bermuda	51 ^{a)}	-	-	-	-	-	-	-	-	-	-
British Honduras	119	119	100.0	-	-	48	40.3	71	59.7	-	-
Dominica	70	18	25.7	18 ^{d)}	100.0	-	-	-	-	-	-
Falkland Island	2 ^{a)}	-	-	-	-	-	-	-	-	-	-
French Guiana	41 ^{a)}	41 ^{a)}	100.0	25 ^{a)}	61.0	13 ^{a)}	31.7	3 ^{a)}	7.3	-	-
Grenada and Carriacou ..	104	34	32.7	34 ^{d)}	100.0	-	-	-	-	-	-
Guadeloupe	330	289	87.6	289	100.0	-	-	-	-	-	-
Martinique	333 ^{a)}	207 ^{a)}	62.2	207 ^{a)}	100.0	-	-	-	-	-	-
Montserrat	15 ^{a)}	-	-	-	-	-	-	-	-	-	-
Netherland Antilles	212 ^{a)}	-	-	-	-	-	-	-	-	-	-
Panama Canal Zone	50	50	100.0	-	-	50	100.0	-	-	-	-
Puerto Rico	2 747	2 416	88.0	2 416	100.0	-	-	-	-	-	-
St. Kitts-Nevis-Anguilla ..	61 ^{a)}	-	-	-	-	-	-	-	-	-	-
St. Lucia	112	96	85.7	96 ^{d)}	100.0	-	-	-	-	-	-
St. Pierre-Miquelon	5 ^{a)}	-	-	-	-	-	-	-	-	-	-
St. Vincent	93 ^{a)}	-	-	-	-	-	-	-	-	-	-
Surinam	358	233	65.1	-	-	178	76.4	55	23.6	-	-
Virgin Islands (U. K.)	9 ^{a)}	-	-	-	-	-	-	-	-	-	-
Virgin Islands (U. S.)	51 ^{a)}	51	100.0	51 ^{a)}	100.0	-	-	-	-	-	-
Total	484 664	174 704	36.0	72 441	41.5	45 812	26.2	56 234	32.2	217	0.1

- None.

a) 1967 figures. b) Figures from "Monthly Bulletin of Statistics" United Nations, Feb. 1969. c) Estimated by Government, July 1968. d) Population in areas where eradication of malaria has been certified by PAHO.

e) Population and Vital Statistics Report, United Nations, July, 1968. f) Includes an area with 4 888 807 inhabitants where eradication of malaria has been certified by PAHO.

Table 6

STATUS OF MALARIA ERADICATION IN THE AMERICAS, BY AREA, 1968
(Area in km²)

Country or other political 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	111 661	32.0	79 624	22.8	157 766	45.2	-	-
Barbados	430	430	100.0	430	100.0	-	-	-	-	-	-
Bolivia	1 098 581	821 346	74.8	-	-	579 512	70.6	241 834	29.4	-	-
Brazil	8 511 965	6 908 489	81.2	1 056	0.001	151 089	2.2	6 756 344	97.8	-	-
Canada	9 221 016	-	-	-	-	-	-	-	-	-	-
Chile	741 767	55 287	7.5	55 287	100.0	-	-	-	-	-	-
Colombia	1 138 914	970 849	85.2	-	-	154 458	16.0	769 391	79.2	47 000	4.8
Costa Rica	50 900	35 446	69.6	-	-	8 472	23.9	26 974	76.1	-	-
Cuba	114 524	37 502	32.7	-	-	37 502	100.0	-	-	-	-
Dominican Republic	48 442	47 562	98.2	4 909	10.3	33 394	70.2	9 259	19.5	-	-
Ecuador	291 906	175 462	60.1	-	-	29 479	16.8	145 983	83.2	-	-
El Salvador	21 149	19 300	91.3	-	-	5 411	28.0	13 889	72.0	-	-
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	101 367	90.4	-	-	55 731	55.0	45 636	45.0	-	-
Jamaica	11 428	10 028	87.7	10 028	100.0	-	-	-	-	-	-
Mexico	1 967 183	1 150 000	58.5	-	-	574 565	50.0	575 435	50.0	-	-
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	99.9	-	-	-	-	406 552	100.0	-	-
Peru	1 285 216	961 172	74.8	84 497	8.8	327 685	34.1	548 990	57.1	-	-
Trinidad and Tobago	5 605	5 444	97.1	5 444	100.0	-	-	-	-	-	-
United States of America	9 359 781	2 309 601	24.7	2 309 601	100.0	-	-	-	-	-	-
Uruguay	186 926	-	-	-	-	-	-	-	-	-	-
Venezuela	912 050	600 000	65.8	461 259	76.9	-	-	138 741	23.1	-	-
Antigua	280	-	-	-	-	-	-	-	-	-	-
Bahamas	11 396	-	-	-	-	-	-	-	-	-	-
Bermuda	53	-	-	-	-	-	-	-	-	-	-
British Honduras	22 965	22 965	100.0	-	-	4 307	18.8	18 658	81.2	-	-
Dominica	751	152	20.2	152	100.0	-	-	-	-	-	-
Falkland Island	11 961	-	-	-	-	-	-	-	-	-	-
French Guiana	86 000	32 000	37.2	200	0.6	23 400	73.1	8 400	26.3	-	-
Grenada and Carriacou..	344	113	32.8	113	100.0	-	-	-	-	-	-
Guadeloupe	1 779	1 136	63.8	1 136	100.0	-	-	-	-	-	-
Martinique	1 080	300	27.8	300	100.0	-	-	-	-	-	-
Montserrat	84	-	-	-	-	-	-	-	-	-	-
Netherland Antilles	961	-	-	-	-	-	-	-	-	-	-
Panama Canal Zone	1 432	1 432	100.0	-	-	1 432	100.0	-	-	-	-
Puerto Rico	8 896	8 896	100.0	8 896	100.0	-	-	-	-	-	-
St. Kitts, Nevis, Anguilla	396	-	-	-	-	-	-	-	-	-	-
St. Lucia	603	510	84.6	510	100.0	-	-	-	-	-	-
St. Pierre and Miquelon	240	-	-	-	-	-	-	-	-	-	-
St. Vincent	389	-	-	-	-	-	-	-	-	-	-
Surinam	163 820	163 750	99.9	-	-	45 995	28.1	117 755	71.9	-	-
Virgin Islands (U. K.)...	174	-	-	-	-	-	-	-	-	-	-
Virgin Islands (U. S.)...	344	344	100.0	344	100.0	-	-	-	-	-	-
Total	40 379 701	15 699 159	38.8	3 095 260	19.7	2 112 056	13.5	10 444 843	66.5	47 000	0.3

In Central America, great progress was made in bringing the situation under control in the problem areas, through the coordinated intensified attack phase initiated in late 1967. The number of cases of malaria in total in the five countries in which intensified attack was begun, was reduced to only 51% of the number in 1967, despite greater case-detection activity; the percentage of blood-smears examined, which were found to be positive for malaria, fell from 7.4% in 1967 to 2.9% in 1968. Honduras experienced the least reduction in incidence, because of an outbreak in an attack-phase area, which heralded the advent of DDT-resistance in this section, where *A. albimanus* had previously been DDT-susceptible. Agricultural spraying as a result of the introduction of cotton cultivation into the area is considered to be the reason for the development of resistance. The area of the outbreak has a population of some 20,000 persons; the limits of the new area of vector resistance to DDT are being investigated through susceptibility testing. The progress of the individual country programs, which were implementing intensified coordinated attack during 1968 in Central America, is shown graphically in Figure 1. Despite the fine progress shown, there is concern about the rising rate of refusals by the population to accept collective treatment with antimalarial drugs, a primary attack measure in areas with DDT and dieldrin resistant vectors.

British Honduras also made excellent progress, finding only 38 cases during the year. In Panama, even though the three-year coordinated attack phase was not fully implemented because of delays in funding and administrative arrangements, the level of cases was sharply reduced.

The Colombian program has had difficulties in the normal developments of its activities in the many colonization areas which are rapidly filling up with population, and impossibility of penetration in some well defined areas. Innovations in attack methods are devised to meet the demands of the local situation in the colonization areas. It is expected that the next two-year attack measures can be applied in the area with social problems.

Ecuador's campaign improved its financial problem during the year and was able to bring its field activities into full operation late in the year.

In the Peruvian program the financial problem forced some reduction of the operating level. In this program also, supplementary attack measures are designed to meet the particular problems posed by such groups as indigenous forest-dwelling people whose housing does not present adequate surfaces for a full action by residual insecticide. (See Chapter II). Progress was made by passing some areas from attack phase to consolidation, and some areas from consolidation phase to maintenance during 1968.

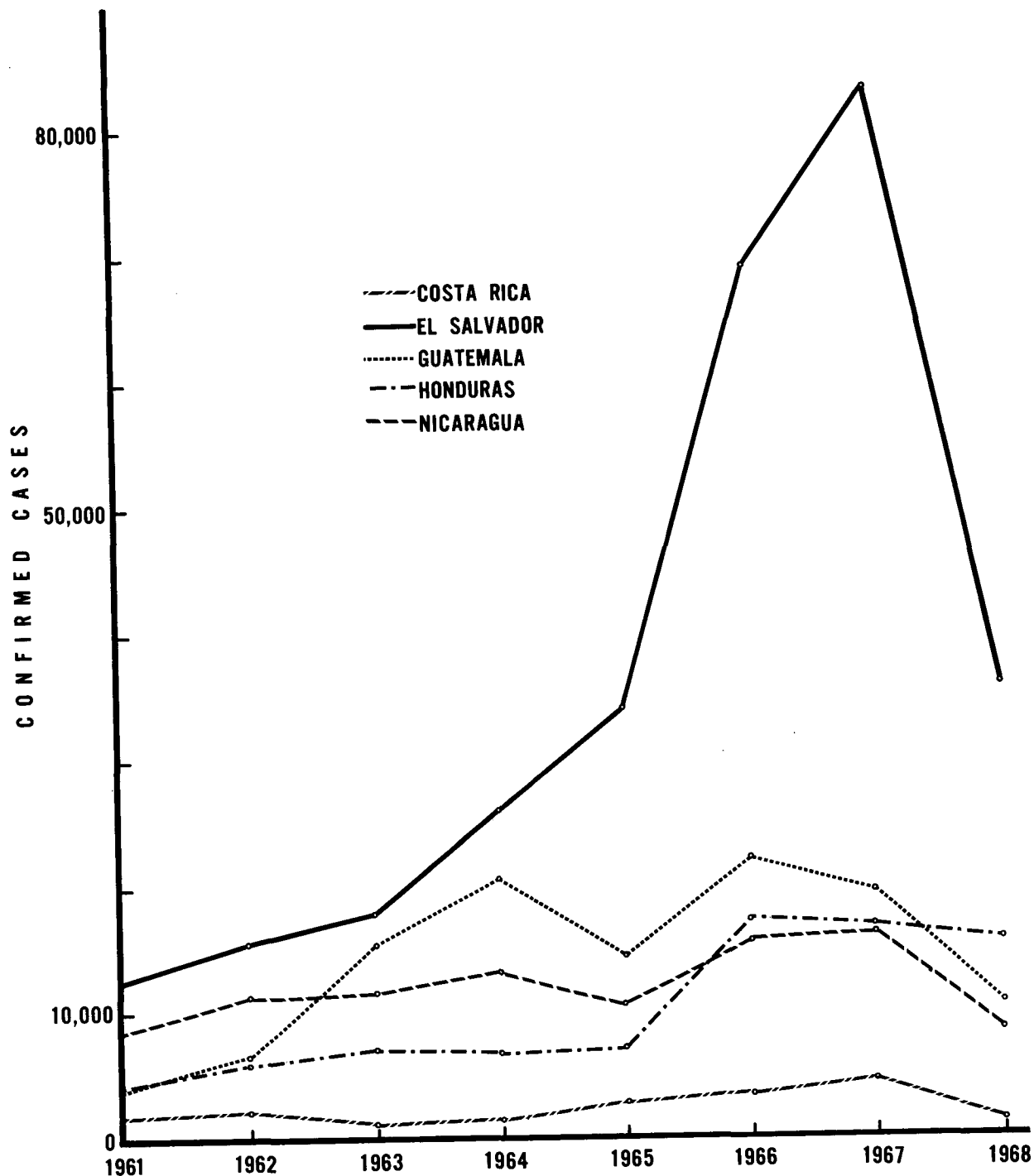
In the maintenance area, a few malaria cases imported from other malarious areas of the same country continued to be controlled. The Government of Peru requested and received the visit of an evaluation team during 1968, which recommended an increase in vigilance activity levels in the maintenance areas and development of equivalent capabilities in an area with a population of 410,000, now in consolidation phase, which is ready for passage to maintenance when minimum criteria for vigilance activities can be met by the general health services. Table 3 presents information on case-detection and positive blood smears encountered in areas in maintenance phase during 1968.

In Bolivia some deterioration occurred in the malaria situation, a result of restricted surveillance activities forced by insufficient budget. This campaign faces no technical problems and has shown its ability to solve operational difficulties and clear even difficult areas, but needs more financial support. The Tomina river area in Chuquisaca, cleared after considerable effort through the use of collective treatment and seasonal spraying, was reinfected during 1968, and several small foci were discovered in the consolidation phase area of La Paz. An area of persistent transmission on the Pilcomayo river was put under collective treatment on two-week cycles and has ceased producing cases of malaria.

Guyana continued its medicated salt program and paid special attention to a small group of balata-bleeders and their dependents, among whom some cases of *P. falciparum* were discovered. Since these people enter the forest and cannot be followed up for as long as half a year, they were given medicated salt with chloroquine and pyrimethamine, because of a history of chloroquine resistance of *P. falciparum* in the area. In addition, a single dose of sulphathiazole and pyrimethamine combination was administered to everybody and hammocks were sprayed before entering the forest. A second treatment with the same combination of drugs will be given when they emerge from the forest. Elsewhere in the country, results were excellent.

FIGURE 1

NUMBER OF CASES OF MALARIA IN THE COUNTRIES OF CENTRAL AMERICA
1961-1968



In Surinam the medicated salt distribution improved, with better acceptance by the population, although on the uppermost part of Surinam River there is still some reluctance. The result of the wider use of the salt was in clear evidence in the lower malaria incidence figures. This program continues to have administrative and personnel problems.

In French Guiana, medicated salt was used along the river bordering Surinam, and this coordinated attack with that of the Surinamese program produced good results.

In Venezuela some small areas were returned from consolidation phase to attack, because of transmission evidenced in recent periods. The general level of incidence remained relatively unchanged.

Brazil, as noted above, brought almost all its remaining preparatory-phase areas, with a population of some 10 million persons, into attack phase at mid-year. The setting-up of operating headquarters, planning of itineraries, and other necessary prerequisites have been performed and attack measures, have been initiated, although in some parts, particularly in the Amazon basin areas truly full coverage will need time for development and greater depth of entomological knowledge and of the habits of the human population is necessary before attack measures can be made satisfactorily effective. This information will be acquired with operations in the area and through continued study of the vectors. The areas which were already in attack phase showed good progress, and some of them were passed to consolidation phase. A small area in consolidation phase was found reinfected and reverted to attack.

A lengthy period of planning and negotiation was satisfactorily concluded in Paraguay and the entire malarious area of the country (which includes nearly the entire country) entered attack phase in October. The plan of operations calls for a four-year attack phase with semi-annual cycles of DDT in the high-incidence area, a shorter attack period of not more than three years in the low-incidence areas, and spraying along river courses in the south. There is excellent popular and governmental support for the program.

In Argentina new areas were added to maintenance phase and other advanced to consolidation phase. The campaign still suffers from inadequate financing, which has prevented faster progress and permitted the appearance of small outbreaks in maintenance areas. These outbreaks were controlled during the year.

The Dominican Republic program was able to pass most of its malarious area, with 2,500,000 inhabitants into consolidation phase, keeping a small area in the frontier with Haiti in attack on the basis of recommendations of an evaluation team which assessed the program. An area of 5,000 km² with a population of 208,000 was passed from consolidation to maintenance phase.

Cuba was able to pass all its malarious area from attack phase to consolidation during 1968. In addition, the Malaria Eradication Service has been integrated into the General Health Services.

In Haiti an evaluation team recommended DDT-spraying in some areas, DDT and mass drugs in others, and passive case-detection only in some. Mass drug administration was initiated before the transmission season on the basis of previous incidence level rather than as a focal-attack measure. Results were good over-all but were impaired in two areas which experienced localized outbreaks with considerable number of cases. Spraying activities were curtailed near the end of the year for operational and budgetary reasons, but will be reinitiated in 1969.

C. Field Operations

The increased activity in eradication programs during 1968 is clearly apparent in the figures for personnel employed in eradication programs at the end of 1968, when compared with those for 1967 (Table 7). Personnel increased in each of the four activities, the apparent decrease in epidemiological personnel resulting merely from the fact that the Mexican program did not provide separate figures for evaluators and spraymen for 1968 and the former are included with the latter. The details of the personnel of the various programs are shown in Tables 8 through 11.

Table 7

PERSONNEL EMPLOYED IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS
31 DECEMBER 1967 AND 1968, BY CATEGORY

(Part-time personnel in parentheses)

Title		1967	1968
SPRAYING OPERATIONS	Engineers	96 (1)	96 (1)
	Spraying Chiefs (non-professionals)	282 (2)	350 (2)
	Sector Chiefs	705	611
	Squad Chiefs	2 053	1 923
	Spraymen	8 961 (71) ^{a)}	13 048 (80) ^{a)}
	Draftsmen	141	214
	SUB-TOTAL	12 238 (74)	16 242 (83)
EPIDEMIOLOGICAL OPERATIONS	Physicians	233 (21)	256 (7)
	Entomologists	46 (2)	38 (16)
	Entomologist Assistants	215 (2)	212 (3)
	Statisticians and Statisticians' Assistants	311	249
	Evaluation Inspectors	1 144 (2) ^{a)}	943 (1) ^{a)}
	Evaluators	7 213 ^{a)}	6 843 ^{a)}
	Microscopists	989 (14)	1 064 (88)
	SUB-TOTAL	10 151 (41)	9 605 (115)
ADMINISTRATION AND OTHERS	Administrators	160	222
	Administrative Assistants	1 197	1 250
	Accountants	35	76
	Disbursing Officers	92	100
	Storekeepers	109	114
	Storekeepers' Assistants	174	391
	Secretaries	338	379 (2)
	Others	1 430 (1)	1 684 (1)
	SUB-TOTAL	3 535 (1)	4 216 (3)
TRANSPORT	Transport Chiefs, Mechanics and Assistant Mechanics	771	709
	Drivers	1 470 (2)	1 838 (2)
	Motorboat Operators	339 (2)	485 (2)
	Boatmen	329	318
	SUB-TOTAL	2 909 (4)	3 350 (4)
GRAND TOTAL		28 833 (120)	33 413 (205)

a) Includes personnel with same category from the mass drug treatment program.

Table 8

PERSONNEL EMPLOYED IN SPRAYING OPERATIONS IN MALARIA ERADICATION PROGRAMS
IN THE AMERICAS - 31 DECEMBER 1968

(Part-time personnel in parentheses)

Country or other political unit	Total	Engineers	Sanitarians or Spraying Chiefs	Sector Chiefs	Squad Chiefs	Spraymen	Draftsmen
Argentina	140	2	3	7	27	86	15
Bolivia	49(60)	-	9 ^{a)}	24 ^{a)}	1	15(60)	-
Brazil	8 309	37	228	106	707	7 177	54
Colombia ^{b)}	1 152	7	22	68	271	768	16
Costa Rica	164	-	2	29	34	96	3
Dominican Republic	70	1	2	-	10	57	-
Ecuador ^{b)}	428	2	4	37	61	322	2
El Salvador	457	1	5	20	82	347	2
Guatemala	576	-	6	18	92	456	4
Guyana	32	-	-	-	6	26	-
Haiti	220	1	14	22	31	148	4
Honduras	257	-	8	8	39	201	1
Mexico	2 406	35	-	158	279	1 916 ^{c)}	18
Nicaragua	338	1	7	23	56	249 ^{d)}	2
Panama	243	1	2	9	43	187	1
Paraguay	471	2	7	21	86	350	5
Peru	197	4	16 ^{a)}	29 ^{a)}	33	109	6
Trinidad and Tobago	119	-	1	1	2	88 ^{d)}	27
Venezuela ^{e)}	472	2	-	27	40	350	53
British Honduras	25	-	1	-	4	20	-
French Guiana	71	-	12	-	8	51	-
Panama Canal Zone	(23)	(1)	(2)	-	-	(20) ^{d)}	-
Surinam	46	-	1	4	11	29	1
Total	16 242 (83)	96(1)	350 (2)	611	1 923	13 048 (80)	214

... No information.

- None.

a) Performing supervision for evaluation operations also. b) October. c) Includes evaluators. d) Includes personnel with same category from the larviciding program. e) September.

Table 9

**PERSONNEL EMPLOYED IN EPIDEMIOLOGICAL EVALUATION OPERATIONS IN MALARIA ERADICATION
PROGRAMS IN THE AMERICAS - 31 DECEMBER 1968**

(Part-time personnel in parentheses)

Country or other political unit	Total	Physicians	Entomologists	Assistant Entomologists	Statisticians and Statisticians' Assistants	Evaluation Inspectors	Evaluators	Microscopists and laboratory personnel
Argentina	215(1)	6(1)	2	2	2	26	151	26
Bolivia	111	8	-	2	6	3	79	13
Brazil	2 289	83	7	42	102	151	1 636	268
Colombia a)	966	12	3	1	3	122	767	58
Costa Rica	155	2	-	2	2	7 ^{b)}	125 ^{b)}	17
Cuba	346	-	-	-	4	48	238	56
Dominican Republic	216	2	1	3	5	25 ^{c)}	143	37
Ecuador a)	178	10	-	5	4	-	124	35
El Salvador	637	8	1	10	7	34 ^{b)}	522 ^{a)}	55
Guatemala	517	3	1	15	6	23 ^{b)}	437 ^{b)}	32
Guyana	29	1	-	-	3	1	20	4
Haiti	1 109	9	1	12	13	175 ^{b)}	817 ^{b)}	82
Honduras	487	3	-	5	16	59 ^{b)}	345 ^{b)}	59
Jamaica	78(1)	13(1)	-	1	1	14	35	14
Mexico	254	59	10	13	14	33	(d)	125
Nicaragua	685	4	1	6	13	86 ^{b)}	534 ^{b)}	41
Panama	50(3)	1	1	3	5	-	28	12(3)
Paraguay	76(6)	1	2(6)	7	13	-	36	17
Peru	288	6	4	16	18	29	179 ^{b)}	36
Trinidad and Tobago	123	2	1	39	1	1	70	9
Venezuela e)	697	21	2	16	9	85	506	58
British Honduras	12(1)	(1)	-	-	-	1	10	1
Dominica	5(1)	(1)	-	-	-	2	2	1
French Guiana	6	1	1	2	-	-	-	2
Grenada	24(1)	-	-	10	-	14	-	(1)
Guadeloupe	7(4)	1(1)	(1)	-	-	-	6	(2)
Panama Canal Zone	(17)	(1)	(1)	(3)	-	-	-	(12)
Puerto Rico	(78)	-	(8)	-	-	-	-	(70)
St. Lucia	3(1)	-	-	-	-	(1)	3	-
Surinam	42(1)	(1)	-	-	2	4	30	6
Total	9 605(115)	256(7)	38(16)	212(3)	249	943(1)	6 843	1 064(88)

... No Information.

- None.

a) October. b) Includes personnel with same category from drug distribution program. c) Performing supervision for spraying operations also.

d) Included with spraymen. e) September.

Table 10
PERSONNEL EMPLOYED IN ADMINISTRATIVE AND OTHER SERVICES IN MALARIA ERADICATION PROGRAMS
IN THE AMERICAS - 31 DECEMBER 1968
(Part-time personnel in parentheses)

Country or other political unit	Total	Adminis- trators	Adminis- trative Assistants	Accountants	Disbursing Officers	Storekeepers	Storekeepers' Assistants	Secretaries	Others
Argentina	136	7	73	-	5	3	6	1	41
Bolivia	30	7	3	1	1	1	2	7	8
Brazil	1 867	144	817	36	43	43	314	35	435
Colombia a)	336	18	16	7	16	18	8	81	172
Costa Rica	44	2	2	1	5	3	6	6	19
Dominican Republic ...	42	1	5	1	-	2	2	2	29
Ecuador a)	93(1)	5	1	6	5	5	1	17	53(1)
El Salvador	370	6	8	1	1	2	4	9	339
Guatemala	105	1	4	5	5	1	4	21	64
Guyana	26	-	-	-	-	1	1	1	23
Haiti	84	3	5	2	1	4	-	24	45
Honduras	57	2	20	1	-	2	2	8	22
Jamaica	21	1	2	-	-	-	-	3	15
Mexico	654	13	244	4	13	13	18	127	222
Nicaragua	91	1	13	5	-	5	9	12	46
Panama	34	1	10	1	-	1	2	6	13
Paraguay	83	1	14	1	4	1	1	3	58
Peru	86	6	11	3	-	5	7	11	43
Trinidad and Tobago ..	23	1	1	1	-	2	2	1	15
Venezuela	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
British Honduras	3	1	-	-	-	-	-	2	-
French Guiana	3	-	-	-	-	-	-	2	1
Panama Canal Zone ...	(2)	-	-	-	-	-	-	(2)	-
Surinam	28	1	1	-	1	2	2	-	21
Total	4 216(3)	222	1 250	76	100	114	391	379(2)	1 684(1)

- None.

a) October.

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

Table 11

PERSONNEL EMPLOYED IN TRANSPORT SERVICES IN MALARIA ERADICATION PROGRAMS
IN THE AMERICAS - 31 DECEMBER 1968

(Part-time personnel in parentheses)

Country or other political unit	Total	Transport Chiefs, mechanics and assistant mechanics	Drivers	Motorboat operators	Boatmen
Argentina	92	44	48	-	-
Bolivia	48	9	31 a)	8 a)	-
Brazil	1 731	227	1 041	203	260
Colombia b)	409	97	106	172	34
Costa Rica	27	11	16	-	-
Dominican Republic	43	20	23	-	-
Ecuador b)	65	10	39	7	9
El Salvador	156	38	118	-	-
Guatemala	70	20	50	-	-
Guyana	17	1	5	6	5
Haiti	64	29	33	1	1
Honduras	79	15	62	2	-
Jamaica	37	4	33	-	-
Mexico	141	103	25	13	-
Nicaragua	120	16	80	24	-
Panama	15	8	6	1	-
Paraguay	84	13	71	-	-
Peru	77	24	21	32	-
Trinidad and Tobago	10	-	10	-	-
Venezuela	(c)	(c)	(c)	(c)	(c)
British Honduras	2	2	-	-	-
French Guiana	11	1	8	2	-
Panama Canal Zone	(4)	-	(2)	(2)	-
Surinam	52	17	12	14	9
Total	3 350(4)	709	1 838(2)	485(2)	318

- None.

... No information.

a) Performing duties as drivers and evaluators.

b) October.

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

Table 12
MEANS OF TRANSPORT IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1968

Country or other political unit	Trucks (3 tons or more)		Trucks and "Pick-up" (less than 3 tons)		Jeeps		Automobiles and station wagons		Motorcycles		Bicycles		Motor boats		Boats without motor		Saddle and pack animals	Other	
	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b		a	b
Argentina	1	6	88	39	30	7	9	1	-	-	54	12	2	-	-	-	-	-	-
Bolivia	-	-	11	4	34	8	1	1	-	9	25	23	23	10	-	-	95	61 d)	11 d)
Brazil	66	-	385	-	951	-	55	-	-	-	810	-	381	-	83	-	3 000	8	-
Colombia	4	11	53	94	31	120	16	24	1	-	120	6	223	47	-	-	1 503	-	-
Costa Rica	-	-	12	-	17	-	5	-	11	11	90	40	17	-	-	-	-	-	-
Cuba	-	-	12	7	60	9	-	-	-	-	-	-	-	-	-	-	177	-	-
Dominican Republic	1	-	72	-	2	-	7	-	124 c)	-	30	62	-	-	-	-	73	-	-
Ecuador	2	2	33	4	55	8	6	2	55	9	36	-	83	6	33	-	247	2 e)	-
El Salvador	1	1	58	2	35	2	8	-	125	4	3	-	2	-	3	-	-	-	-
Guatemala	2	1	45	18	36	10	30	4	93	55	126	149	5	7	-	-	-	12 d)	10 d)
Guyana	1	-	-	1	1	4	-	-	-	-	10	-	11	-	-	-	3	-	-
Haiti	-	5	-	59	57	8	-	10	-	-	-	-	2	-	-	-	-	-	-
Honduras	1	2	31	18	34	14	7	2	51	18	10	35	3	1	-	-	143	1	-
Jamaica	-	2	-	-	12	22	-	2	-	-	-	-	-	-	-	2	-	-	-
Mexico	14	5	224	209	246	153	14	3	-	-	-	-	13	5	-	-	2 070 f)	-	-
Nicaragua	2	-	-	39	-	46	-	13	-	80	-	100	25	3	6	2	-	-	-
Panama	2	-	48	6	17	3	8	-	6	-	-	-	19	12	-	-	5	-	-
Paraguay	2	-	78	10	-	15	14	3	21	3	3	-	14	-	-	-	8	-	-
Peru	-	-	46	3	16	2	65	1	-	-	-	-	104	12	-	-	-	-	-
Trinidad and Tobago	-	2	-	-	2	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	6	-	137	-	93	-	35	-	18	-	333	-	124	-	-	-	635	36 g)	-
British Honduras	-	-	4	-	5	3	1	-	-	-	-	3	1	-	6	2	-	-	-
Dominica	-	-	-	-	-	-	1	-	1	2	-	-	-	-	-	-	-	-	-
French Guiana	1	-	1	-	8	-	-	-	2	-	2	-	1	-	5	-	-	-	-
Guadeloupe	-	-	-	-	-	-	2	1 h)	-	-	-	-	-	-	-	-	-	-	-
Panama Canal Zone	-	-	2 h)	-	-	-	-	-	-	-	-	-	2 h)	-	2 h)	-	-	-	-
St. Lucia	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-
Surinam	-	-	-	2	1	-	3	3	17	-	3	2	-	-	29	-	-	-	-
Total	106	37	1 340	515	1 743	440	288	70	526	191	1 655	432	1 055	103	167	6	7 959	120	21

- None

a) In good condition. b) In bad condition. c) Property of the users. d) Out-board motors. e) Canoes. f) Property of the users; CNEP only pays for their maintenance. g) Fogging machines. h) Part-time.

In spraying operations, the Central American countries, Brazil, Ecuador, Paraguay and Haiti show the greatest increases. The increased dimension of activity in Brazil, with the addition of the previous preparatory-phase areas to attack phase, is shown in the increase from 5,035 to 8,309 persons engaged in spraying operations; the initiation of the attack phase in Paraguay is reflected in the increase from 163 spraymen to 471; the ending of the paralysis of field operations in Ecuador shows up in the change from 84 spraymen at the end of 1967 to 428 at the end of 1968. The increase are primarily in the category of spraymen, spraying chiefs and draftsmen. The number of engineers remained unchanged, although individual programs altered their employment figures.

The number employed in epidemiological operations increased slightly in total but in some programs it was considerably increased. The number of physicians went up from 233 to 256. The decrease in entomologists and statisticians and their assistants is sharpest in Mexico.

In all enterprises, increased operations require increased administrative services and the number of administrators, accountants, storekeepers' assistants and other categories of administrative personnel has risen in comparison with 1967 levels. Administrative reforms have been introduced in many campaigns to improve the efficiency of the supply chain, the flexibility of the responses which can be made to changes in field needs, and the promptness of payments.

In transport operations, the increases are primarily in the categories of drivers and motorboat operators. Brazil and Colombia show large increases in the latter as a result of the expansion of attack operations to Amazon areas under other fluvial-transport territories. Brazil and Paraguay account for the largest increases in drivers, mainly in connection with attack operations.

Means of transport continued to be supplied primarily through the generosity of UNICEF. Since transport is the lifeblood of the malaria eradication operation, which can be carried out only if it is possible to reach the most remote corners of the interior, this assistance is highly valued. (See Table 12). UNICEF also continued to supply most of the insecticides, laboratory needs, and many smaller items. The dollar value and distribution among programs of UNICEF assistance can be seen in Table 20 in Chapter IV.

In Table 13 is a summary of case-detection which has been done in the Americas yearly since 1958. The details program by program are presented in the country tables by phase of program.

Table 13
SUMMARY OF CASE DETECTION IN THE AMERICAS, 1958-1968

Year	Number of slides examined	Number of slides found positive	Per cent positive
1958	1 716 103	56 705	3.3
1959	2 749 117	75 612	2.8
1960	3 955 149	79 998	2.0
1961	5 341 004	99 539	1.9
1962	7 221 367	177 089	2.4
1963	7 903 156	227 026	2.9
1964	8 156 290	254 572	3.1
1965	9 069 950	241 462	2.7
1966	11 599 783	333 245	2.9
1967	11 609 226	369 341	3.2
1968	12 522 696	282 772	2.2

In Table 14 the data concerning active and passive case-detection are presented country by country. The higher likelihood of encountering malaria cases among persons who present themselves to the passive case-detection network continues to be apparent, with 4.66% positivity among the smears collected as compared with 1.05% in the smears collected through active case-detection.

D. Budget

Table 15 summarizes 1968 expenditures of the Government and PAHO for malaria eradication and estimated budgetary requirements for 1969, 1970 and 1971. The table also shows estimated PAHO budgetary and personnel requirements. Actual expenditures of the Governments for malaria eradication in 1967 and 1968 and the budgets approved for 1969 are shown program by program in Table 16. The 18.3% increase in national expenditures on malaria eradication in 1968 as compared with 1967 is unmistakable evidence of the determination of the Governments to push eradication activities to their goal and of their recognition of the need for adequate levels of financing if this goal is to be reached in the optimum time and at the lowest possible total cost.

The advance of the Brazilian program with the inclusion in attack phase of the tremendous area previously in preparatory phase marks a major step forward in coordination of activities among programs, promising to reduce border problems for many South American programs. The increased expenditures in 1968 reflect this expansion of operations. Paraguay's initiation of full-scale attack operations will likewise have favorable repercussions for the Argentinian and Brazilian programs. Central America experienced no financial difficulties during 1968. The administrative and financial problems which caused the delay in the initiation of the program in Panama will be solved in the near future. It is also expected that Mexico will be able to give new impetus to its program before the situation on the border with Guatemala becomes of international concern.

(Text continues on page 108)

Table 14

COMPARATIVE RESULTS OF ACTIVE AND PASSIVE CASE DETECTION IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1968

Country or other political unit	Active case detection					Passive case detection						Total	
	Average number of evaluators	Bloods slides			Average production per evaluator per month	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	132	215 466	265	0.12	136.0	998	230	25 393	314	1.24	9.2	240 859	579
Bolivia	85	147 411	1 084	0.74	144.5	2 603	510	40 224	914	2.27	6.6	187 635	1 998
Brazil (Excl. São Paulo)	1 691	1 390 907	25 776	1.85	68.5	15 845	6 882	502 231	54 536	10.86	6.1	1 893 138	80 312
Brazil (São Paulo).....	138	146 000	249	0.17	88.2	5 024	770	42 541	763	1.79	4.6	188 541	1 012
Colombia	639	550 930	14 634	2.66	71.8	9 109	4 621	307 927	12 699	4.12	5.6	858 857	27 333
Costa Rica	80	127 523	458	0.36	132.8	979	274	14 506	733	5.05	4.4	142 029	1 191
Cuba .....	...	234 129	-	-	...	...	...	599 978	4	0.0	...	834 107	4
Dominican Republic.....	141	378 712	11	0.0	223.8	4 834	2 931	276 490	10	0.0	7.9	655 202	21
Ecuador	112	59 964	976	1.63	44.6	5 552	3 050	290 219	36 067	12.43	7.9	350 183	37 043
El Salvador	95	495 239	6 467	1.31	434.4	2 444	2 001	310 072	29 364	9.47	12.9	805 311	35 831
Guatemala.....	87	281 729	5 222	1.85	270.0	3 310	2 091	211 211	5 185	2.45	8.4	492 940	10 407
Guyana.....	...	49 764	50	0.10	...	...	32	5 453	11	0.20	14.2	55 217	61
Haiti	330	948 693	1 875	0.20	2 396	7 291	2 878	225 212	687	0.31	6.5	1 173 905	2 562
Honduras	119	326 302	5 132	1.57	228.5	2 764	1 749	258 394	10 533	4.08	12.3	584 696	15 666
Jamaica.....	...	20 630	-	-	...	...	...	78 951	2	0.0	...	99 581	2
Mexico.....	1 134	2 082 577	15 710	0.75	153.0	42 948	5 018	324 260	10 330	3.19	5.4	2 406 837	26 040
Nicaragua	144	268 373	3 308	1.23	155.3	2 996	1 247	143 171	4 942	3.45	9.6	411 544	8 250
Panama	24	57 627	786	1.36	200.1	1 861	152	25 584	839	3.28	14.0	83 211	1 625
Paraguay.....	17	3 670	240	6.54	18.0	2 632	881	110 100	20 503	18.62	10.4	113 770	20 743
Peru.....	140	136 700	1 186	0.87	81.4	6 584	1 524	110 416	824	0.75	6.0	247 116	2 010
United States ^{a)} .....	-	-	-	-	-	...	...	1 494 ^{b)}	2 610 ^{c)}	...	...	1 494	2 610
Trinidad and Tobago....	75	16 316	4	0.02	18.1	82	82	49 441	1	0.0	50.2	65 757	5
Venezuela	422	339 804	4 095	1.21	67.1	2 915	580	187 649	1 640	0.87	26.9	527 453	5 735
British Honduras.....	8	6 140	13	0.21	64.0	127	72	6 131	26	0.42	7.1	12 271	38
Dominica.....	3	3 908	-	-	108.6	26	7	1 289	-	-	15.3	5 197	-
French Guiana .....	...	6 409	8	0.12	...	18	7	723	42	5.81	8.6	7 132	50
Grenada	1	218	-	-	18.2	-	-	-	-	-	-	218	-
Guadeloupe .....	...	13 968	-	-	...	...	...	50	-	-	-	14 018	-
Panama Canal Zone ....	...	1 809	-	-	...	...	...	20 558	89	0.43	...	22 367	89
St. Lucia .....	...	6 771	-	-	...	...	...	-	-	-	-	6 771	-
Surinam	28	22 131	283	1.28	65.9	70	21	13 208	1 272	9.63	52.4	35 339	1 555
Total	5 645	8 339 820	87 832	1.05	123.1	121 012	37 610	4 182 876	194 940	4.66	9.3	12 522 696	282 772

... No information.

a) Including Puerto Rico. b) Includes only those slides examined at NCDC. c) Includes additional cases reported from state and military laboratories.

Table 15

NATIONAL EXPENDITURES 1967-1968 AND BUDGET 1969
FOR MALARIA ERADICATION IN THE AMERICAS

(In thousands of U. S. dollars)

Country	National expenditures 1967	National Expenditures 1968			National Budget, 1969		
		Internal financing	Loans AID	Total	Internal financing	Loans AID	Total
Argentina	860	921	-	921	923	-	923
Bolivia	323	323	-	323	308	-	308
Brazil	13 584 ^{a)}	16 330	1 945	18 275	17 129	1 785	18 914
Colombia	2 854	3 114	-	3 114	3 090	-	3 090
Costa Rica	520 ^{b)}	466	255	721	491	299	790
Cuba	1 980	1 128	-	1 128	...	...	...
Dominican Republic ..	771	782	-	782	782	-	782
Ecuador	640	449 ^{c)}	403	852	853	550	1 403
El Salvador	964 ^{d)}	600	803	1 403	868	1 065 ^{e)}	2 366 ^{f)}
Guatemala	1 483 ^{g)}	1 148	509	1 657	977	675 ^{h)}	1 652
Guyana	57	75	-	75	75	-	75
Haiti	35	35	1 587 ⁱ⁾	1 622	35	1 350	1 385
Honduras	1 238 ^{j)}	413	836	1 249	750	520	1 270
Jamaica	824 ^{k)}	744	-	744	825	-	825
Mexico	6 508	6 508	-	6 508	6 508	-	6 508
Nicaragua	870 ^{l)}	657	1 151	1 808	1 057	1 402	2 459
Panama	700	722	-	722	743	591	1 334
Paraguay	345	422	70	492	429	603	1 032
Peru	811	833	-	833	(m)	(m)	(m)
Trinidad and Tobago ..	409	417	-	417	433	-	433
Venezuela	5 456	5 245	-	5 245	5 245	-	5 245
British Honduras	88	102	-	102	86	-	86
French Guiana	195	195	-	195	268	-	268
Panama Canal Zone ..	50	50	-	50	50	-	50
Surinam	294	275	-	275	294	-	294
Total	41 859	41 954	7 559	49 513	42 219	8 840	51 492

- None. ... No information available.

a) Includes \$981 250 from AID Loan. b) Includes \$198 764 from AID Loan. c) Up to November 30, 1968. d) Includes \$363 920 from AID Loan. e) \$35 000 from AID Loan approved, \$1 030 000 in negotiation. f) Includes a carry-over of \$432 920 from the approved loan for the years 1967 and 1968. g) Includes \$653 821 from AID Loan. h) \$386 738 from AID Loan approved and \$288 800 in negotiation. i) AID grant. j) Includes \$902 365 from AID Loan. k) Includes general mosquito control program. l) Includes \$379 383 from AID Loan. m) Budget not yet approved.

Table 16

ESTIMATED REQUIREMENTS FOR MALARIA ERADICATION IN THE AMERICAS a)
SUMMARY

	1968 ^{b)}	1969 ^{c)}	1970 ^{c)}	1971 ^{c)}
TOTAL COST	45 851 040	50 013 902	66 937 027	64 418 536
GOV. AND OTHER SOURCES	43 057 000	46 789 500	63 725 200	61 327 800
PAHO/WHO PORTION:				
Personnel costs and travel	2 399 588	2 484 655	2 533 598	2 468 536
Supplies and equipment	305 513	612 533	579 200	525 200
Fellowships	15 858	47 400	43 000	41 600
Grants and others	73 081	79 814	56 029	55 400
SUB-TOTAL PAHO/WHO	2 794 040	3 224 402	3 211 827	3 090 736

SOURCES OF PAHO/WHO FUNDING

Source	1968 ^{b)}	1969 ^{c)}	1970 ^{c)}	1971 ^{c)}
PAHO-Reg.	281 057	679 544	880 772	1 080 581
PAHO-SMF	1 372 407	1 799 785	1 556 004	1 236 147
WHO-Reg.	684 705	493 300	500 000	500 000
WHO-MESA	395 869	205 573	205 751	204 708
WHO-TA	60 002	46 200	69 300	69 300
TOTAL	2 794 040	3 224 402	3 211 827	3 090 736

PAHO/WHO PERSONNEL

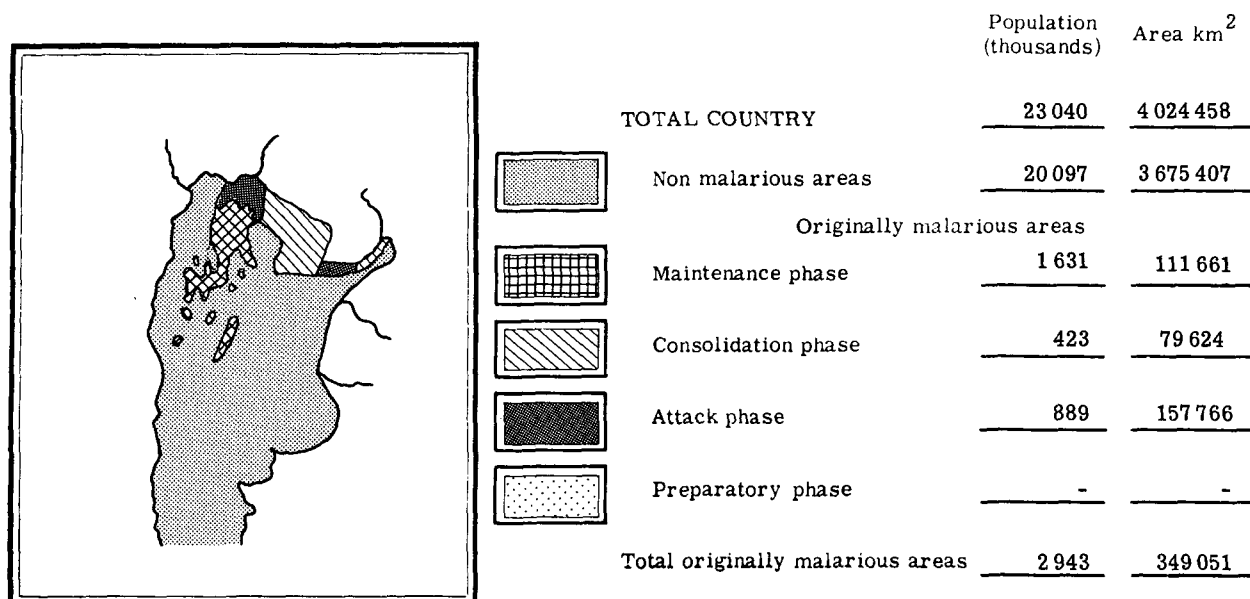
Category	1968	1969	1970	1971
Medical Officer	40	39	38	37
Sanitary Engineer	15	12	12	10
Entomologist	12	9	6	5
Parasitologist	2	2	2	2
Malariologist	1	-	-	-
Epidemiologist	3	2	2	1
Economist	-	1	1	1
Statistician	1	1	1	1
Programmer Analyst	1	1	2	2
Adm. Methods Officer	7	4	4	4
Assistant Engineer	1	1	1	1
Assistant Entomologist ...	2	-	-	-
Health Educator	2	-	-	-
Laboratory Adviser	2	1	1	1
Sanitary Inspector	59	41	36	34
Other	14	15	15	15
TOTAL	162	129	121	114

a) Figures shown include all malaria eradication country projects, AMRO projects, supporting personnel in Zone offices and Malaria Eradication Department, they do not include activities in countries or territories entirely in maintenance phase, nor those of Venezuela.

b) Expenditures. c) Estimated requirements.

ARGENTINA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	138	2	140
Evaluation operations	209(1)	6	215(1)
Administrative and other	2	134	136
Transport	-	92	92
Total	349(1)	234	583(1)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	53	67	61	181
Two-wheel vehicles	-	64	2	66
Boats	2	-	-	2
Animals	-	-	-	-
Other	-	-	-	-
Total	55	131	63	249

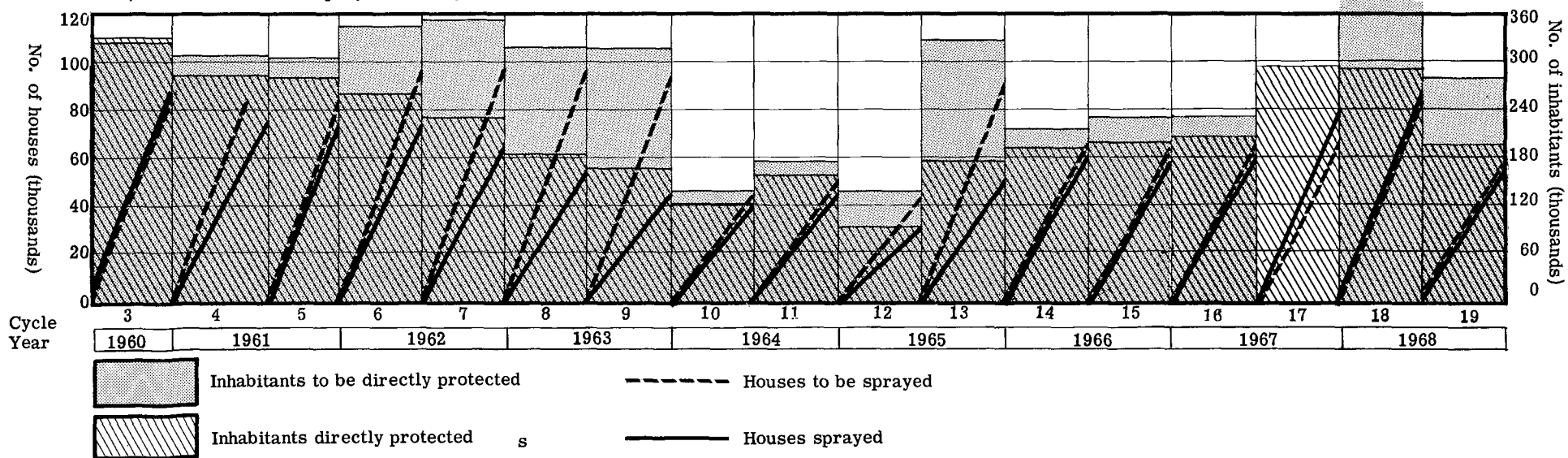
(Part-time personnel in parentheses)

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	
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	
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	
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	
10th	Jul. 68-Dec. 68	19th	55 730	54 382	278 000	194 479	454	23.3

a) Some houses were sprayed once a year.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1959 ^{a)}	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	96 668	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	-

CONSOLIDATION PHASE AREAS

Date		Estimated population in the area (thousands)	No. of slides examined	% of popu- lation sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malarae</u>
								from abroad	from areas within country						
1959 ^{b)} (a)		911	9 491	2.5	51	-	-	-	32	-	19	-	-	51	-
1960 ^{b)} 1-4		929	14 438	1.5	26	-	-	-	14	-	12	-	-	26	-
1961 ^{b)} 1-4		1 278	44 395	3.5	17	-	2	-	5	-	10	-	-	17	-
1962 ^{b)} 1-4		1 542	39 675	2.6	23	-	10	-	5	1	7	-	-	20	3
1963 ^{b)} 1-4		1 584	60 742	3.8	11	2	-	-	6	2	-	1	-	9	2
1964	1-2 ^{b)}	1 648	41 926	5.1	10	1	-	-	7	-	2	-	-	10	-
	3-4	627	24 415	7.8	1	1	-	-	-	-	-	-	-	1	-
1965	1-4	449	92 658	20.6	41	20	-	1	8	3	7	2	-	38	3
1966	1-4	454	71 346	15.7	56	27	1	1	26	1	-	-	-	56	-
1967	1-4	387	82 208	21.2	53	41	1	5	1	-	-	5 ^{c)}	1	52	-
1968	1st	423	14 813	14.0	15	10	-	1	2	-	-	2	-	15	-
	2nd		20 997	20.0	26	13	-	6	3	-	-	4	-	26	-
	3rd		19 368	18.2	4	3	-	-	-	-	-	1	-	4	-
	4th		20 122	19.2	81	75	-	1	1	-	-	4	-	81	-

a) August-December. b) Including maintenance phase area. c) Includes one cryptic case.

ARGENTINA (Cont.)

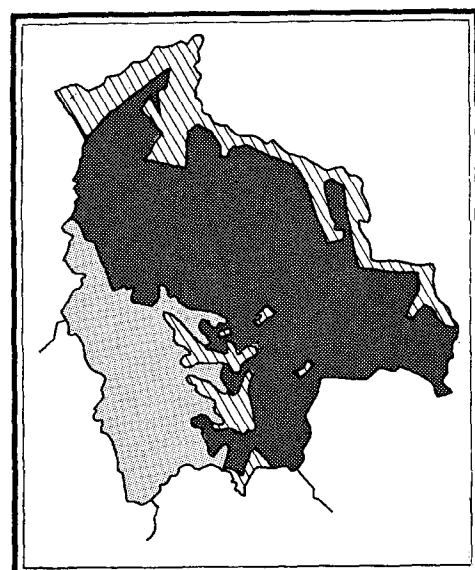
MAINTENANCE PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1964	3rd 4th	1 021	5 428 7 270	2.1 2.8	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
1965	1st	1 356	8 093	2.4	-	-	-	-	-	-	-	-	-	-	-
	2nd		7 327	2.2	-	-	-	-	-	-	-	-	-	-	-
	3rd		5 395	1.6	-	-	-	-	-	-	-	-	-	-	-
	4th		11 536	3.4	-	-	-	-	-	-	-	-	-	-	-
1966	1st	1 381	15 250	4.4	39	37	-	-	1	1	-	-	-	38	1
	2nd		11 185	3.2	12	3	3	-	6	-	-	-	-	12	-
	3rd		13 596	3.9	1	-	-	-	-	-	1	-	-	-	1
	4th		10 839	3.1	3	-	1	1	-	1	-	-	-	3	-
1967	1st	1 477	17 035	2.2	1	-	-	-	1	-	-	-	-	1	-
	2nd		20 750	1.8	51	49	-	-	-	1	-	1a)	-	51	-
	3rd		9 503	3.9	-	-	-	-	-	-	-	-	-	-	-
	4th		17 922	2.1	3	-	1	1	-	1	-	-	-	2	1
1968	1st	1 631	30 328	7.4	30	27	-	-	3	-	-	-	-	30	-
	2nd		29 791	7.3	1	-	-	-	-	-	-	1	-	1	-
	3rd		20 035	4.9	-	-	-	-	-	-	-	-	-	-	-
	4th		23 804	5.8	4	-	-	-	4	-	-	-	-	4	-

a) Cryptic case.

BOLIVIA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	4700	1 098 581
Non malarious areas	3 209	277 235
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 245	579 512
Attack phase	246	241 834
Preparatory phase	-	-
Total originally malarious areas	1 491	821 346

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	49 (60)	49(60)
Evaluation operations	9	102	111
Administrative and other	-	30	30
Transport	-	48	48
Total	9	229 (60)	238(60)

TRANSPORT FACILITIES

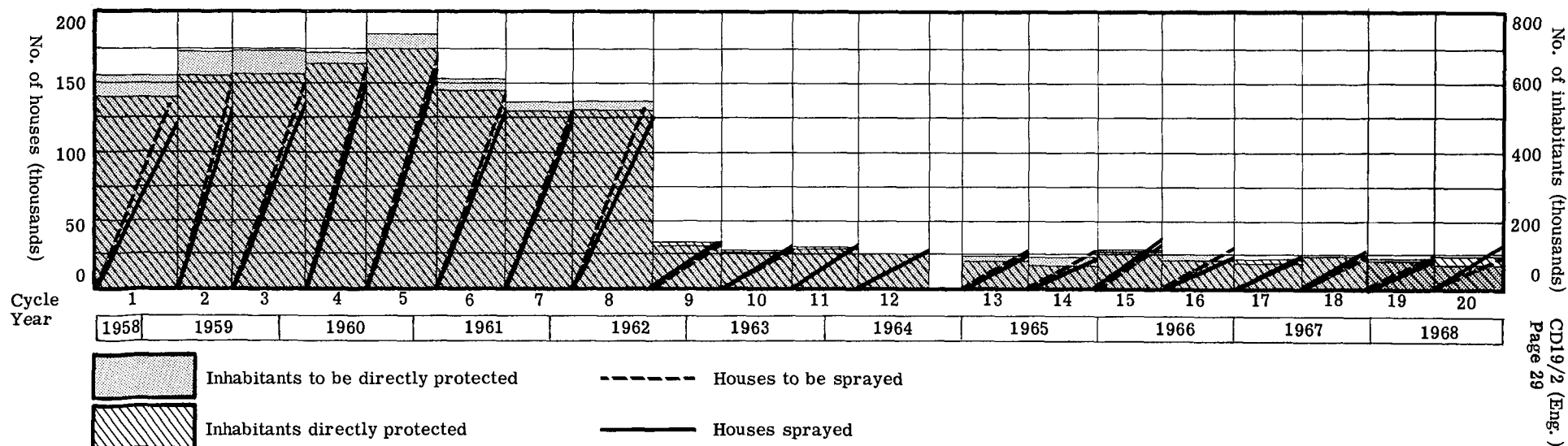
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	10	36	13	59
Two-wheel vehicles	-	25	32	57
Boats	14	16	3	33
Animals	29	66	-	95
Other	24 a)	24 a)	24 a)	72 a)
Total	77	167	72	316

a) Out-board motors.
(Part-time personnel in parentheses)

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	131 444	116 572	1st	6 365	10 910	627 362	556 190	362	115	8.3
		2nd	148 200	129 119				691 820	627 210	331		7.0
2nd	Sep. 59-Aug. 60	3rd	147 263	136 601	2nd	11 331	12 268	695 521	634 859	319	118	7.6
		4th	153 514	142 536				692 274	660 185	309		7.2
3rd	Sep. 60-Aug. 61	5th	169 690	159 952	-	-	-	742 902	700 295	331	-	7.6
		6th	142 210	134 173				612 356	577 743	329		7.5
4th	Sep. 61-Sep. 62	7th	129 600	124 623	-	-	-	546 005	524 986	353	-	7.9
		8th	135 474	128 898				551 785	525 005	359		8.6
5th	Oct. 62-Sep. 63	9th	32 561	34 469	-	-	-	124 643	131 962	408	-	6.0
		10th	32 361	28 893				110 578	98 727	428		5.9
6th	Oct. 63-Sep. 64	11th	32 361	32 160	-	-	-	123 923	123 152	533	-	5.3
		12th	28 536	27 509				101 503	97 855	547		5.6
7th	Jan. 65-Dec. 65	13th	26 941	24 634	-	-	-	96 020	87 799	557	-	5.3
		14th	26 941	16 357				94 987	57 671	575		4.1
8th	Jan. 66-Dec. 66	15th	27 130	29 752	-	-	-	97 375	106 787	588	-	4.7
		16th	27 130	23 839				100 023	87 890	617		4.6
9th	Jan. 67-Dec. 67	17th	24 161	24 733 a)	-	-	-	86 980	82 565 a)	654	-	4.9
		18th	24 992	30 254 a)				89 971	90 813 a)	584		4.5
10th	Jan. 68-Dec. 68	19th	24 156	20 861 a)	-	-	-	80 075	79 631 a)	543	-	6.1
		20th	21 387	32 353 a)				70 897	95 240 a)	609		4.7

a) Includes emergency sprayings.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958 ^{a)}	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	-

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1961	1-4	461	11 975	2.6	14	1	1	5	7	-	-	-	-	14	-
1962	1-3	759	18 131	3.2	21	-	-	2	19	-	-	-	-	21	-
1963	1-3	1 179	58 587	7.4	104	18	1	-	73	-	2	10	4	100	-
1964	1-4	1 141	66 207	5.8	452	154	7	5	21	-	-	265	20	430	2
1965	1-4	1 173	119 954	10.2	96	50	-	8	22	-	-	16	2	92	2
1966	1-4	1 202	126 410	10.5	368	209	11	-	59	-	-	89	26	342	-
1967	1st	1 214	18 607	6.1	64	10	-	4	7	-	-	43	2	62	-
	2nd		25 997	8.6	59	30	-	-	8	-	-	21 ^{b)}	-	59	-
	3rd		28 251	9.3	73	38	1	-	7	-	-	27	-	73	-
	4th		28 182	9.3	435	191	-	-	4	-	-	240	103	332	-
1968	1st	1 245	22 219	7.1	101	82	3	-	8	-	-	8	36	65	-
	2nd		20 094	6.5	246	188	7	1	21	-	-	29	82	164	-
	3rd		24 292	7.8	235	157	2	2	17	-	-	57	33	202	-
	4th		23 034	7.4	246	72	1	4	6	-	-	163	33	213	-

a) September-December. b) Includes 1 congenital case.

STATUS OF MALARIA PROGRAM AT DECEMBER 1968

BRAZIL



	Population (thousands)	Area km ²
TOTAL COUNTRY	88 102	8 511 965
Non malarious areas	50 811	1 603 476
Originally malarious areas		
Maintenance phase	780	1 056
Consolidation phase	11 078	151 089
Attack phase	25 433	6 756 344
Preparatory phase	-	-
Total originally malarious areas	37 291	6 908 489

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	37	8 272	8 309
Evaluation operations	94	2 195	2 289
Administrative and other	10	1 857	1 867
Transport	-	1 731	1 731
Total	141	14 055	14 196

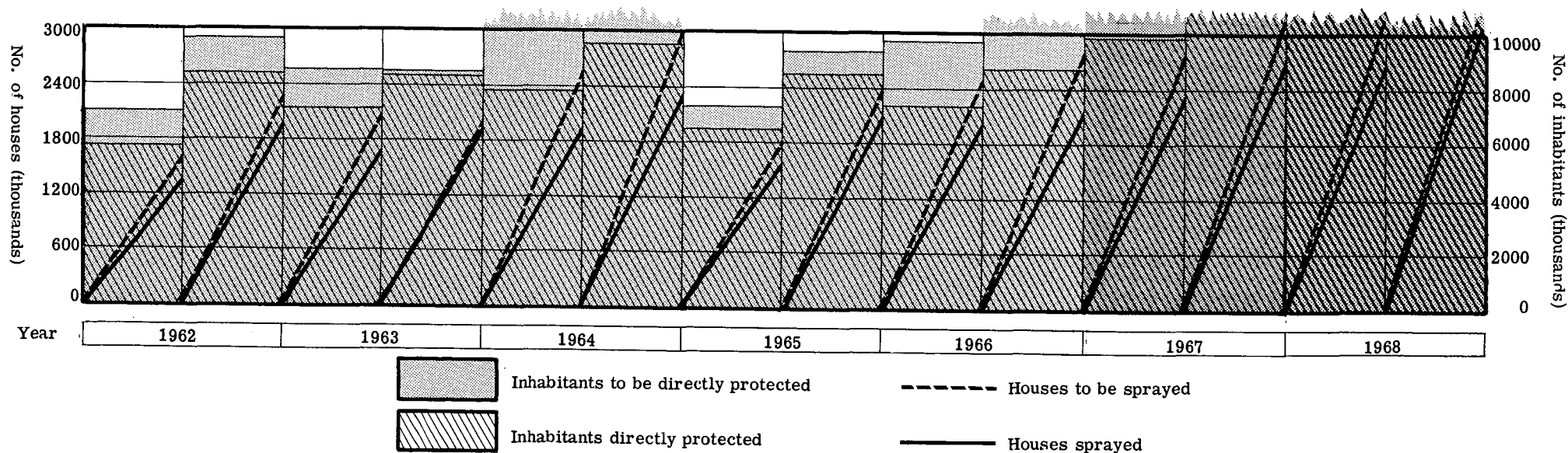
TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	1 457	1 457
Two-wheel vehicles	-	810	-	810
Boats	388	76	-	464
Animals	2 707	293	-	3 000
Other	-	-	8	8
Total	3 095	1 179	1 465	5 739

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



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1965	1-4	1 439	132 231	9.2	70	1	1	-	60	-	-	8	14	56	-
1966	1-3	2 541	162 102	8.5	228	54	7	-	98	-	-	69	34	194	-
1967	1-4	6 000	426 185	7.1	586	171	65	-	157	3	4	186	209	377	-
1968	1-4 ^{c)}	5 926	537 347	9.1	1 148	261	11	4	542	3	17	310	591	556	1

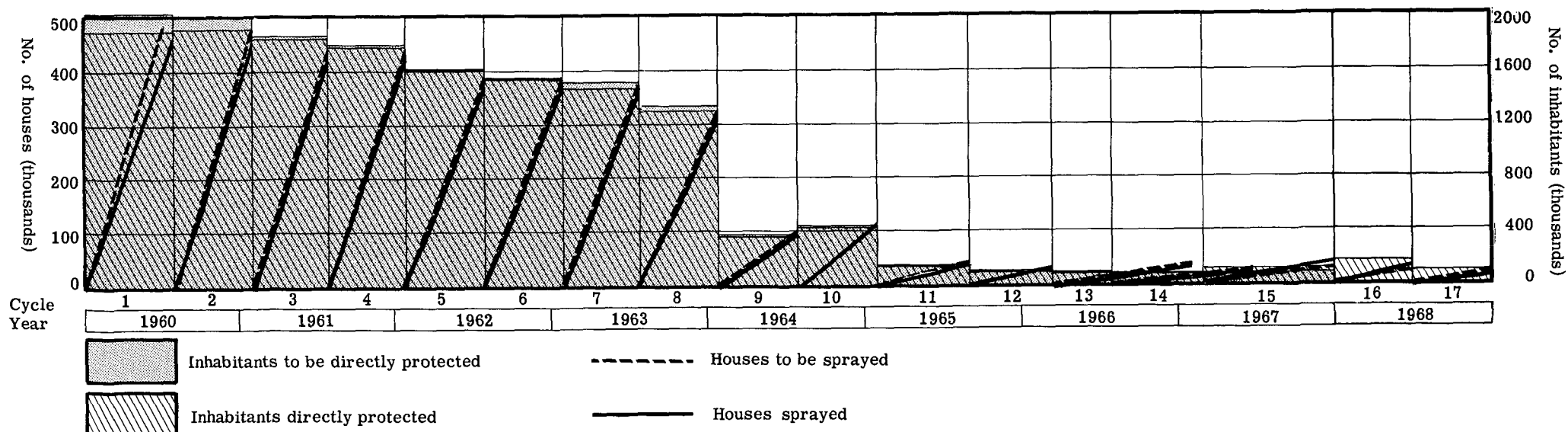
MAINTENANCE PHASE AREAS

1966	1-3	733	22 161	4.0	7	-	-	-	7	-	-	-	3	3	1
1967	1-4	756	23 588	3.1	9	1	-	-	8	-	-	-	2	7	-
1968	1-4 ^{c)}	780	19 690	2.5	10	-	-	-	10	-	-	-	-	10	-

(a) Includes 1,005 undifferentiated mixed infections from Espírito Santo Sector. (b) Includes 4th quarter for areas in consolidation and maintenance phases. c) Data for last 2 months not separated by phase.

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
		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
		16th	22 252	23 910	...	170 314	426	8.5
9th	Jul. 68-Dec. 68	17th	22 252	18 292	...	77 154	401	9.3



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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	1.0	269	796	2
1968	65 264	434	0.7	205	229	-

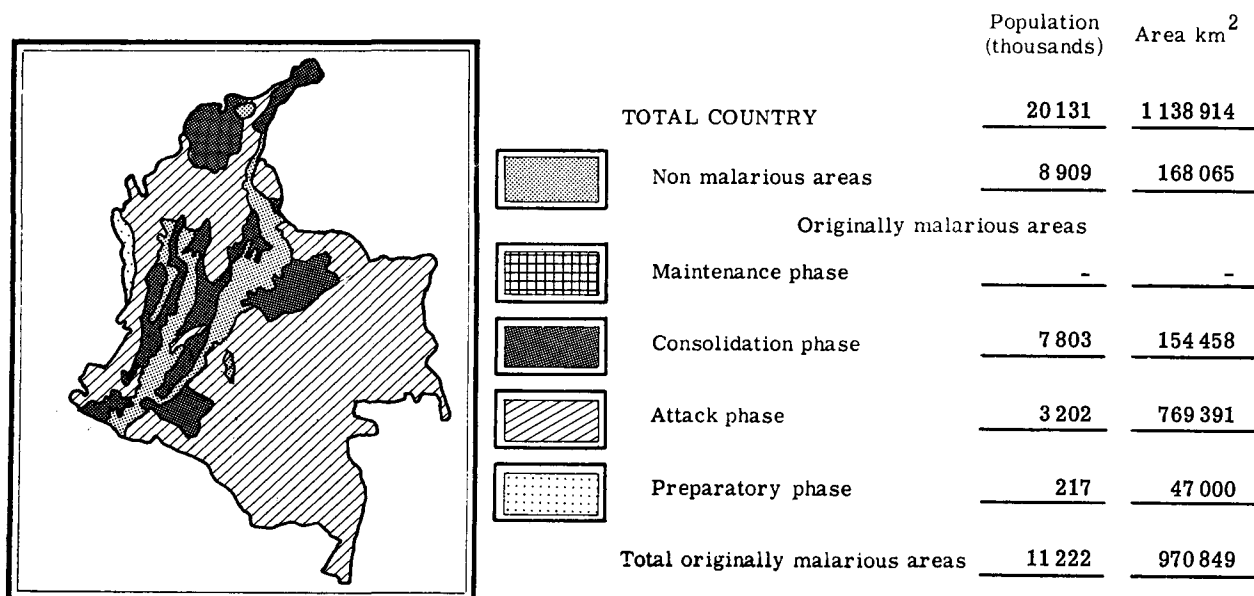
CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1964	1-4	2 183	307 014	14. 1	476	21	15	-	402	-	9	29 ^{b)}	69	407	-
1965	1-4	3 766	140 491	3. 7	691	29	3	-	599	6	10	44 ^{b)}	112	579	-
1966	1-4	3 974	139 865	3. 5	982	295	9	2	622	2	5	47	234	747	1
1967	1-4	5 152	95 383	1. 9	261	43	1	-	199	2	13	3	105	154	2
1968	1st	5 152 ^{c)}	27 403	2. 1	112	10	-	1	91	1	1	8	34	78	-
	2nd		35 159	2. 7	129	29	-	1	87	-	-	12	30	99	-
	3rd		29 475	2. 3	114	-	1	-	111	-	-	2	58	56	-
	4th		31 240	2. 4	223	60	-	2	137	-	-	24	139	84	-

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

COLOMBIA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	7	1 145	1 152
Evaluation operations	12	954	966
Administrative and other	18	318	336
Transport	1	408	409
Total	38	2 825	2 863

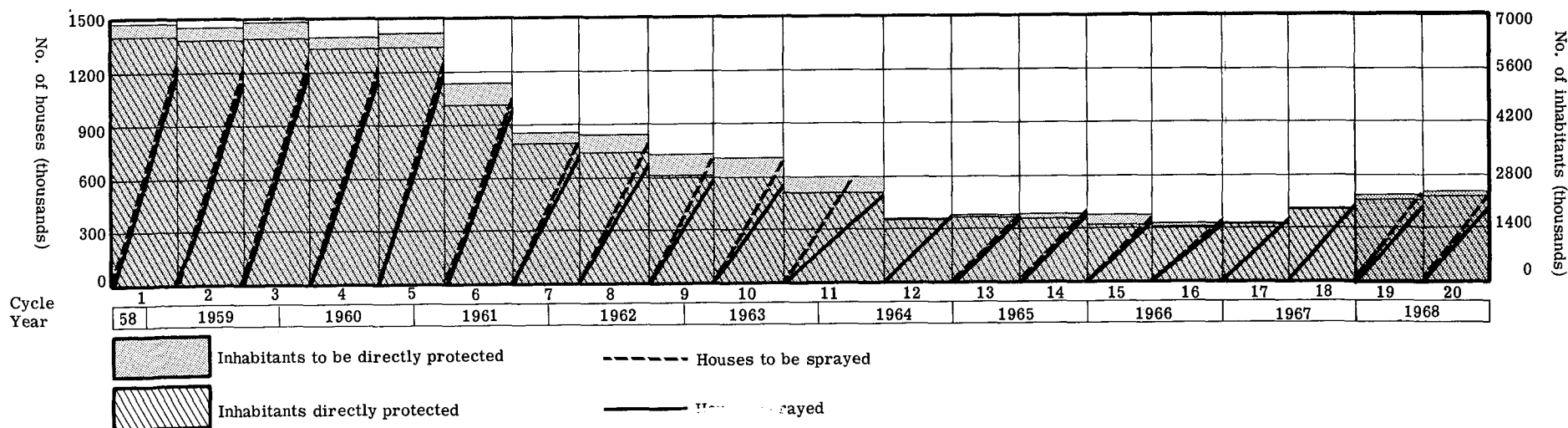
TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	86	184	83	353
Two-wheel vehicles	-	118	9	127
Boats	106	121	43	270
Animals	714	730	59	1 503
Other	-	-	-	-
Total	906	1 153	194	2 253

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	449 437	2 294 006	2 120 499	567	5.4
		20th	502 051	467 461 ^{c)}	2 375 849	2 285 575	455	5.3

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 m².



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

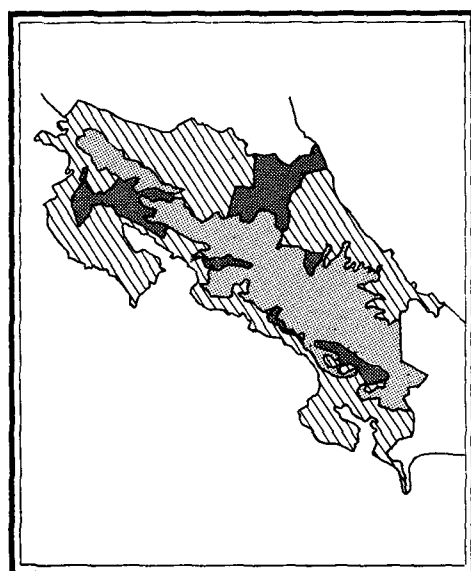
Year	Slides examined			Species found		
	Total No.	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1959	329 288	4 172	1.3	1 195	2 942	35
1960	509 920	8 426	1.6	3 758	4 642	26
1961	570 160	16 974	3.0	10 235	6 694	45
1962	626 995	17 350	2.8	9 619	7 697	34
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	447 495	24 869	5.2	14 798	10 050	21

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1962	2-4	3 027	70 250	3.1	147	48	4	-	72	5	-	18	99	48	-
1963	1-4	5 305	120 814	2.3	450	83	1	-	279	7	7	73	262	188	-
1964	1-4	6 053	178 408	3.0	1 214	224	-	1	774	-	27	188	578	635	1
1965	1-4	7 071	316 044	4.7	3 548	464	2	13	2 129	8	4	928	2 002	1 543	3
1966	1st	8 193	79 008	3.9	1 215	277	1	9	620	-	6	302	581	634	-
	2nd		88 556	4.3	1 031	230	1	8	568	-	5	219	478	553	-
	3rd		99 167	4.8	1 210	253	-	6	694	1	7	249	556	654	-
	4th		95 694	4.7	1 141	247	1	-	595	2	4	292	505	634	2
1967	1st	8 127	112 711	5.5	1 402	439	-	4	638	1	2	318	837	565	-
	2nd		119 352	1.5	1 283	366	1	6	683	-	3	224	749	533	1
	3rd		103 216	5.1	904	341	1	10	436	1	12	103	541	362	1
	4th		100 666	5.0	628	128	1	6	318	2	14	159	332	296	-
1968	1st	7 803	87 835	4.5	560	129	1	5	367	-	4	54	236	323	1
	2nd		94 821	4.9	513	81	-	5	329	2	4	92	215	298	-
	3rd		97 147	5.0	684	95	4	5	448	-	3	129	367	314	3
	4th		101 559	5.2	707	114	-	7	465	-	3	118	348	359	-

COSTA RICA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	1 648	50 900
Non malarious areas	1 138	15 454
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	156	8 472
Attack phase	354	26 974
Preparatory phase	-	-
Total originally malarious areas	510	35 446

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	164	164
Evaluation operations	3	152	155
Administrative and other	3	41	44
Transport	-	27	27
Total	6	384	390

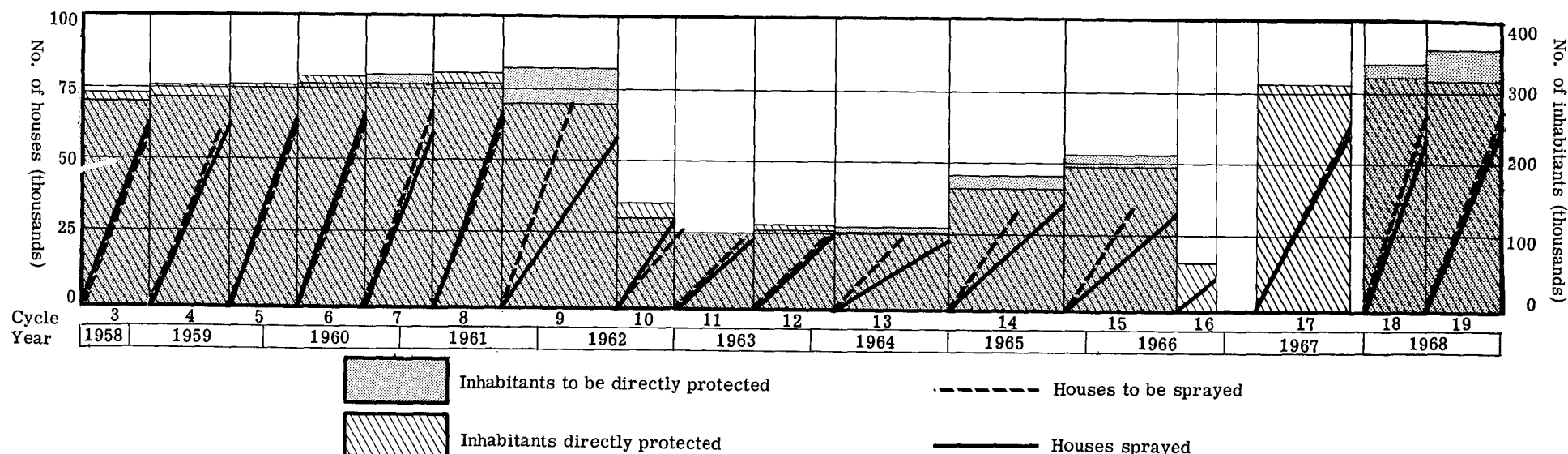
TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	13	9	12	34
Two-wheel vehicles	-	60	92	152
Boats	12	-	5	17
Animals	-	-	-	-
Other	-	-	-	-
Total	25	69	109	203

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

a) In addition, 3,573 houses were sprayed with dieldrin. b) With dieldrin; plus 5,660 emergency spraying with dieldrin and 1,532 with DDT. c) Dieldrin. d) Operations suspended. e) with dieldrin; plus 1,396 emergency spraying with DDT. f) Emergency sprayings.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1957	18 136	1 153	6.4	98	1 037	18
1958	36 801	2 139	5.8	151	1 981	7
1959	52 536	1 899	3.6	121	1 775	3
1960	67 643	2 000	3.0	64	1 936	-
1961	87 893	1 673	1.9	18	1 655	-
1962	131 058	1 482	1.1	5	1 476	1
1963	124 475	857	0.7	7	850	-
1964	47 940	566	1.2	-	566	-
1965	95 027	1 846	1.9	1	1 845	-
1966	121 696	2 594	2.1	1	2 593	-
1967	138 486	4 349	3.1	-	4 349	-
1968	115 889	1 156	1.0	-	1 156	-

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1962	3-4	230	52 594	45.7	101	-	15	4	12	-	51	19	-	101	-
1963	1-4	255	133 375	52.3	371	244	45	-	7	-	10	65	-	371	-
1964	1-4	294	75 345	25.6	646	351	19	2	16	-	1	257	10	636	-
1965	1-4	263	102 724	39.1	717	196	3	-	4	-	2	512	3	714	-
1966	1st	276	33 866	49.1	78	37	2	-	5	-	-	34	-	78	-
	2nd		34 496	50.0	113	54	1	-	4	-	-	54	-	113	-
	3rd		35 488	51.4	159	55	4	4	4	-	49	43	-	159	-
	4th		24 589	35.6	103	8	-	-	-	-	-	95	-	103	-
1967	1st	151	2 363	6.2	4	2	-	-	-	-	-	2	-	4	-
	2nd		5 609	14.8	17	10	-	-	4	-	-	3	-	17	-
	3rd		8 562	22.5	38	14	-	-	7	-	-	17	-	38	-
	4th		9 089	23.9	35	15	-	-	5	-	-	15	-	35	-
1968	1-4	156	26 140	16.8	35	11	5	-	10	-	8	1	-	35	-

CUBA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	8 074	114 524
Non malarious areas	5 340	77 022
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	2 734	37 502
Attack phase	-	-
Preparatory phase	-	-
Total originally malarious areas	2 734	37 502

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	-	-
Evaluation operations	-	346	346
Administrative and other	-	-	-
Transport	-	-	-
Total	-	346	346

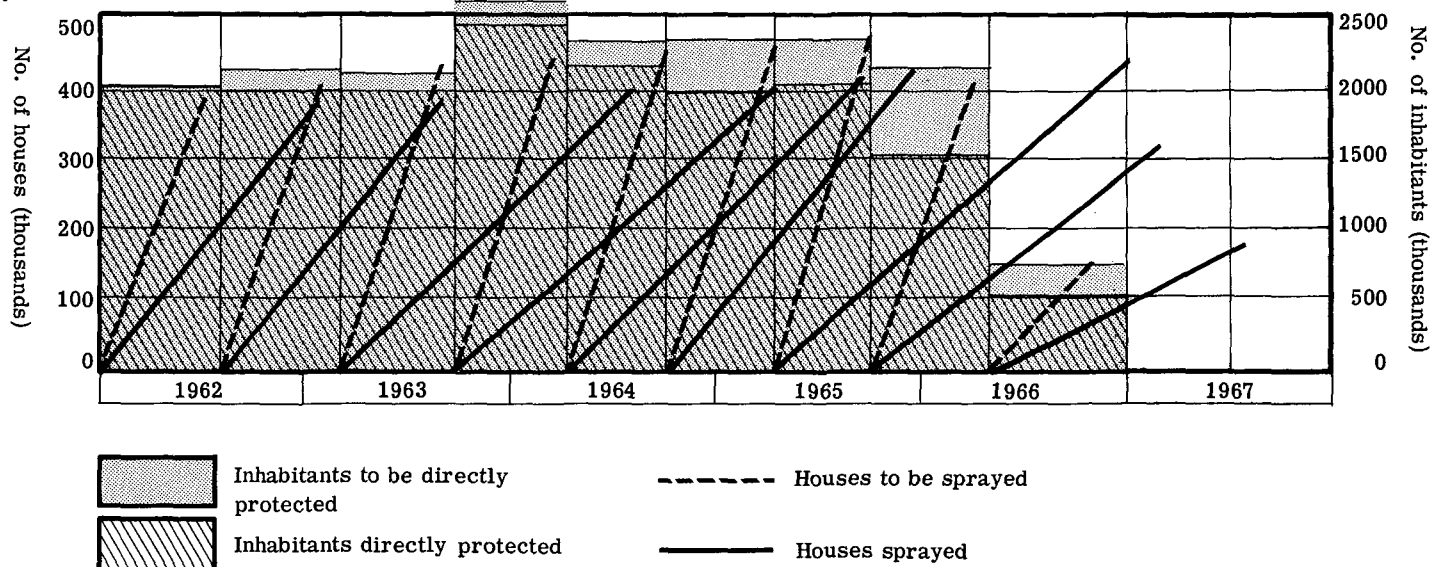
TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	69	19	88
Two-wheel vehicles	-	-	-	-
Boats	-	-	-	-
Animals	-	177	-	177
Other	-	-	-	-
Total	-	246	19	265

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-Jan. 63	1st	391 155	385 020	2 007 000	1 975 528	210	9.7
	Jul. 62-Aug. 63	2nd	411 773	389 914	2 125 572	2 012 831	209	10.0
2nd	Mar. 63-Jul. 64	3rd	432 891	398 940	2 110 456	1 944 936	222	9.1
	Oct. 63-Mar. 65	4th	440 285	407 546	2 641 710	2 445 886	271	8.5
3rd	Apr. 64-Sep. 65	5th	454 923	423 361	2 283 531	2 125 145	248	9.1
	Oct. 64-Dec. 65	6th	460 484	431 349	2 289 065	2 127 888	238	9.2
4th	Apr. 65-Nov. 66	7th	467 312	438 527	2 315 390	2 172 753	240	8.9
	Oct. 65-Feb. 67	8th	417 596	320 363	2 084 221	1 569 778	245	8.9
5th	Apr. 66-Sep. 67	9th	194 000	165 865	747 372	812 739	239	8.4
	Jan. 67-Dec. 67	10th	...	34 949	...	246 334	220	8.5
6th	May. 67-Jul. 67	11th ^{a)}	...	8 378	...	37 051	223	6.6
	Nov. 67-Dec. 67	12th ^{a)}	...	2 191	...	10 171	225	8.2
7th	Jan. 68-Jul. 68	-	-	5 174	-	25 945	-	-

(a) Cycle not yet finished.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS ^{a)}

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1960 ^{b)}	28 791	1 325	4.6	197	1 128	-
1961 ^{b)}	91 181	3 230	3.5	128	3 102	-
1962	100 247	3 515	3.5	31	3 484	-
1963	126 334	833	0.7	6	827	-
1964	276 470	624	0.2	-	623	1
1965	423 790	131	0.03	-	131	-
1966 ^{c)}	465 199	27	0.01	1	26	-
1967	365 239	41	0.01	10	21	10

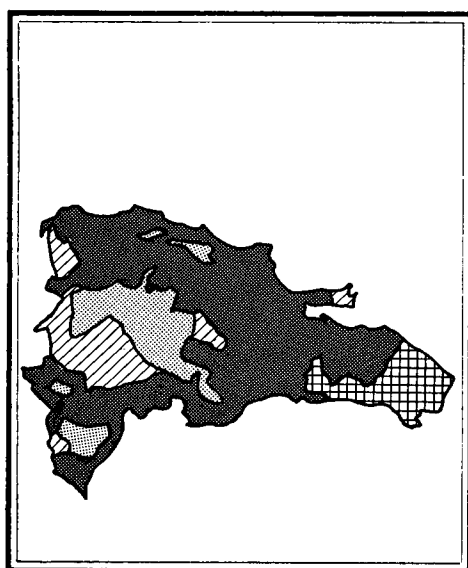
CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Autochthonous	Relapsing	Imported		Induced	Introduced	Unclassified	<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
								from abroad	from areas within country						
1966	(d)	5 488 ^{e)}	236 464 ^{e)}	5.2	9	3	-	5	1	-	-	-	4	4	1
1967	1-4	2 649	520 075	19.6	5	4	-	1	-	-	-	-	-	5	-
1968	1-4	2 734	834 107 ^{f)}	30.5	4 ^{f)}	-	-	4	-	-	-	-	-	4	-

a) All areas previously in Attack Phase transferred to Consolidation in 1968. b) Pre-eradication survey. c) Includes information for November and December for areas in Consolidation Phase. d) January-October. e) Including the non-malarious area and the area that passed into Consolidation Phase in September. f) Including 239 296 slides and four cases taken in non-malarious areas.

DOMINICAN REPUBLIC

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	<u>4 029</u>	<u>48 442</u>
Non malarious areas	<u>34</u>	<u>880</u>
Originally malarious areas		
Maintenance phase	<u>208</u>	<u>4 909</u>
Consolidation phase	<u>3 321</u>	<u>33 394</u>
Attack phase	<u>466</u>	<u>9 259</u>
Preparatory phase	<u>-</u>	<u>-</u>
Total originally malarious areas	<u>3 995</u>	<u>47 562</u>

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	69	70
Evaluation operations	2	214	216
Administrative and other	1	41	42
Transport	-	43	43
Total	4	367	371

TRANSPORT FACILITIES

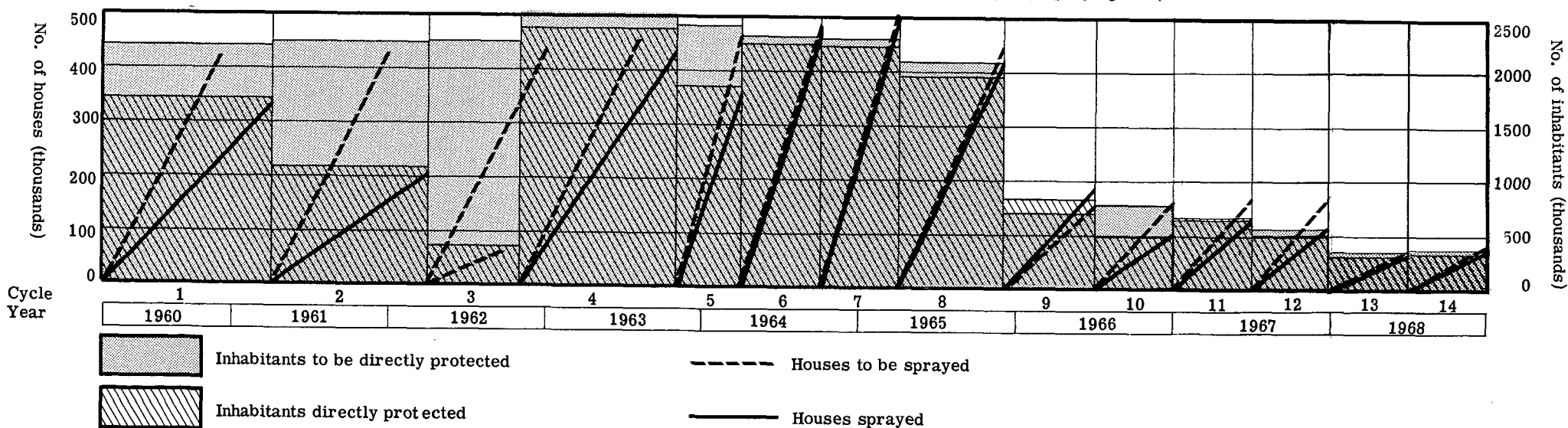
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	14	54	14	82
Two-wheel vehicles	92	124 (a)	-	216
Boats	-	-	-	-
Animals	-	73	-	73
Other	-	-	-	-
Total	106	251	14	371

a)Property of the users.

SPRAYING OPERATIONS

Year of total coverage	Date	Houses sprayed with DDT						Inhabitants directly protected		Insecticide used per house (g. technical)	Average houses sprayed per spray-man/day
		Twice a year			Once a year						
		Cycle	Planned	Sprayed	Cycle	Planned	Sprayed	Planned	Protected	DDT	
3rd ^{a)}	Mar. 60-Mar. 62	1st	428 615	332 944	-	-	-	2 206 080	1 713 612	495	9.0
		2nd	428 615	204 531	-	-	-	2 241 656	1 083 459	472	8.4
(b)	Apr. 62-Oct. 62	3rd	428 615	72 499	-	-	-	2 241 656	368 201	424	8.4
4th	Nov. 62-Mar. 64	4th	462 900	438 706	-	-	-	2 530 674	2 398 328	468	8.2
		5th	472 000	359 653	-	-	-	2 428 110	1 850 166	475	8.4
5th	Apr. 64-Mar. 65	6th	490 000	480 537	-	-	-	2 316 181	2 271 494	449	9.8
		7th	510 575	500 343	-	-	-	2 315 764	2 269 357	355	10.5
6th	Apr. 65-Jun. 66	8th	450 215	411 193	-	-	-	2 104 080	1 921 727	357	10.0
		9th	68 444	68 056	-	89 312	117 205 ^{c)}	728 974	856 077	335	10.4
7th	Jul. 66-Jun. 67	10th	72 769	77 956	-	89 312	25 548	778 783	497 333	339	9.5
		11th	80 772	78 252	-	87 038	46 259	671 240	573 884	348	10.6
8th	Jul. 67-Jun. 68	12th	83 802	80 271	-	87 038	36 622 ^{c)}	683 360	520 388	363	10.3
		13th	73 726	71 011	-	-	118 ^{d)}	346 512 ^{e)}	336 423	346	11.1
9th	Jul. 68-Dec. 68	14th	79 143	72 675	-	-	1 093 ^{d)}	371 972 ^{e)}	347 189	344	10.5

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	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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	-

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au-tochtho-nous	Relaps-ing	Imported		Induced	Intro-duced	Unclassi-fied	<u>P. falci-parum</u>	<u>P. vivax</u>	<u>P. malar-iae</u>
								from abroad	from areas within country						
1966	1st	319	18 873	23.7	6	4	1	-	1	-	-	-	-	6	-
	2nd		11 888	14.9	-	-	-	-	-	-	-	-	-	-	-
	3rd		15 357	19.3	-	-	-	-	-	-	-	-	-	-	-
	4th		20 721	25.9	1	-	-	1	-	-	-	-	1	-	-
1967	1-4	371	97 632	26.3	10	-	1	9	-	-	-	-	10	-	-
1968	1-4	3 321	386 692	11.6	1	-	1	-	-	-	-	-	-	-	1

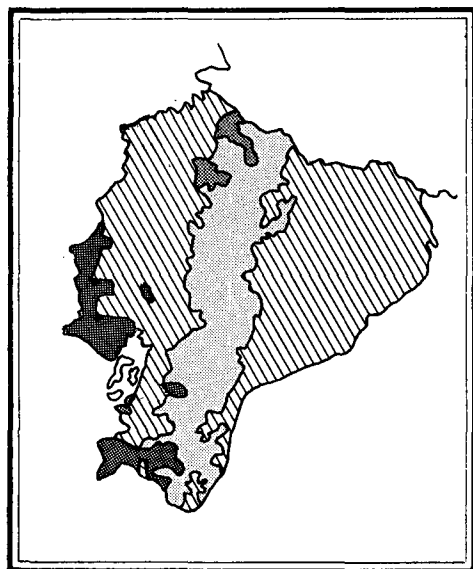
MAINTENANCE PHASE AREAS

1968	1-4	208	55 007	26.4	3	-	1	2	-	-	-	-	2	1	-

a) June-December.

ECUADOR

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	5 417	291 906
Non malarious areas	2 476	116 444
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 376	29 479
Attack phase	1 565	145 983
Preparatory phase	-	-
Total originally malarious areas	2 941	175 462

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	427	428
Evaluation operations	9	169	178
Administrative and other	2(1)	91	93(1)
Transport	-	65	65
Total	12(1)	752	764(1)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	33	16	63	112
Two-wheel vehicles	-	75	25	100
Boats	67	42	13	122
Animals	180	52	15	247
Other	-	2	-	2
Total	280	187	116	583

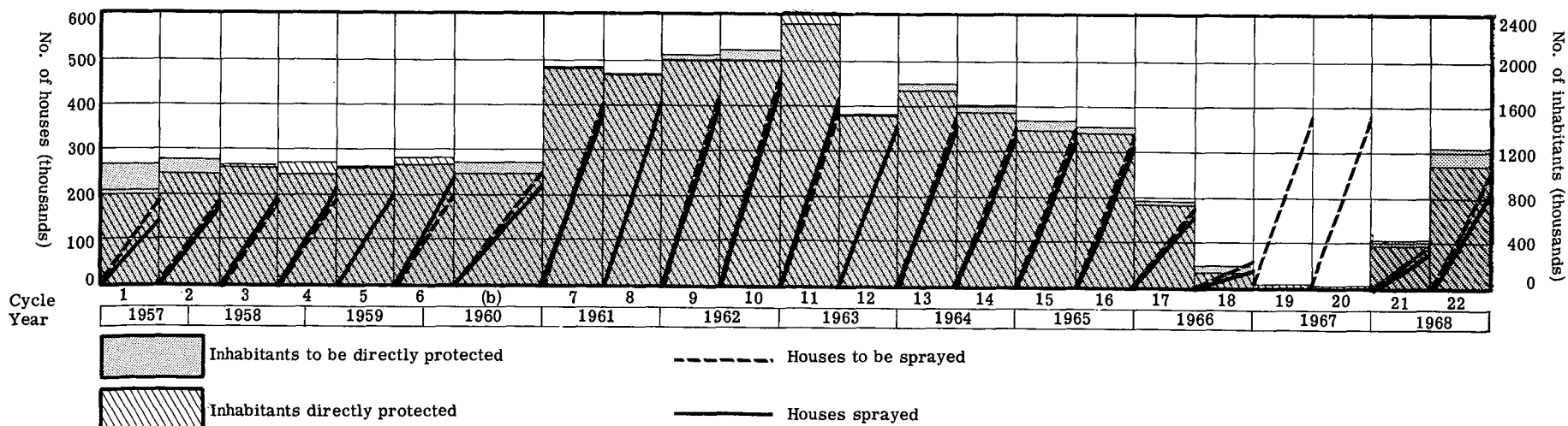
(Part-time personnel in parentheses)

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	160 889 d)	-	-	-	783 316	676 293	480	-	7.4
		18th	47 478	33 934 e)				193 473	138 300	484		7.3
10th	Jan. 67-Oct. 67	19th	375 411	8 524 f)	-	-	-	...	43 856	519	-	6.2
		20th	375 411	6 308 f)				...	37 359	547		6.1
11th	Jan. 68-Dec. 68	21st	96 429	91 538 g)	-	-	-	412 868	391 841	551	-	5.8
		22nd	254 234	207 946 g)				1 247 637	1 185 255	479		6.8

(a) Cycle suspended. (b) Emergency spraying. (c) Estimated. (d) Not included 21,533 supplementary house-spraying.

(e) Not included 8,174 focal sprayings. (f) Not included 7,760 focal sprayings. (g) Not included 22,254 houses sprayed in consolidation areas.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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	-
1967 ^{a)}	147 476	9 077	6.2	688	8 389	-
1968	198 791	32 383	16.3	3 878	28 493	12

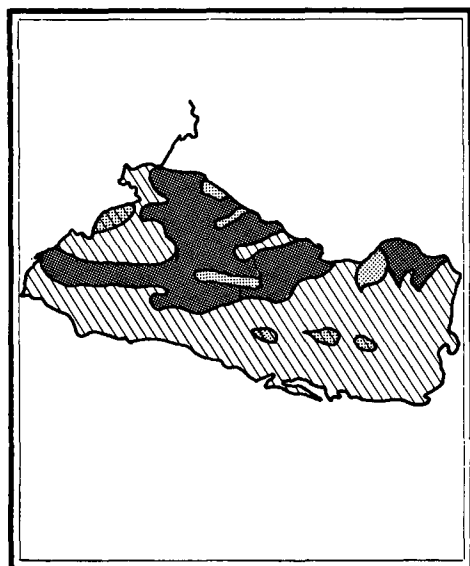
CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1963	1st	625	17 734	11.3	6	-	-	-	6	-	-	-	-	5	1
	2nd	625	19 286	12.3	15	-	-	-	15	-	-	-	1	14	-
	3rd	806	25 488	12.6	29	-	-	-	29	-	-	-	1	28	-
	4th	927	24 270	9.6	47	-	-	-	39	-	-	8	4	43	-
1964	1st	927	23 820	10.3	51	-	-	-	20	-	-	31	4	47	-
	2nd	938	39 275	16.7	118	1	1	-	58	-	2	56	7	111	-
	3rd	1 016	41 398	16.3	129	32	2	-	65	-	7	23	1	128	-
	4th	1 053	36 004	13.7	84	3	-	-	55	-	-	26	1	83	-
1965	1-4	1 288	179 287	13.9	448	72	20	6	278	1	18	53	25	423	-
1966	1-4	1 327	160 354	12.1	661	128	7	-	224	-	23	279	229	432	-
1967	1-4 ^{a)}	1 336	142 184	10.6	1 688	147	1	-	429	-	10	1 101	268	1 420	-
1968	1-4	1 376	151 392	11.0	4 660	190	3	-	1 369	-	8	3 090 ^{b)}	318	4 342	-

a) Figures for November not separated by phase. b) Includes cases not investigated.

EL SALVADOR

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	3 215	21 149
Non malarious areas	1 035	1849
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	505	5 411
Attack phase	1 675	13 889
Preparatory phase	-	-
Total originally malarious areas	2 180	19 300

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	456	457
Evaluation operations	5	632	637
Administrative and other	4	366	370
Transport	-	156	156
Total	10	1 610	1 620

TRANSPORT FACILITIES

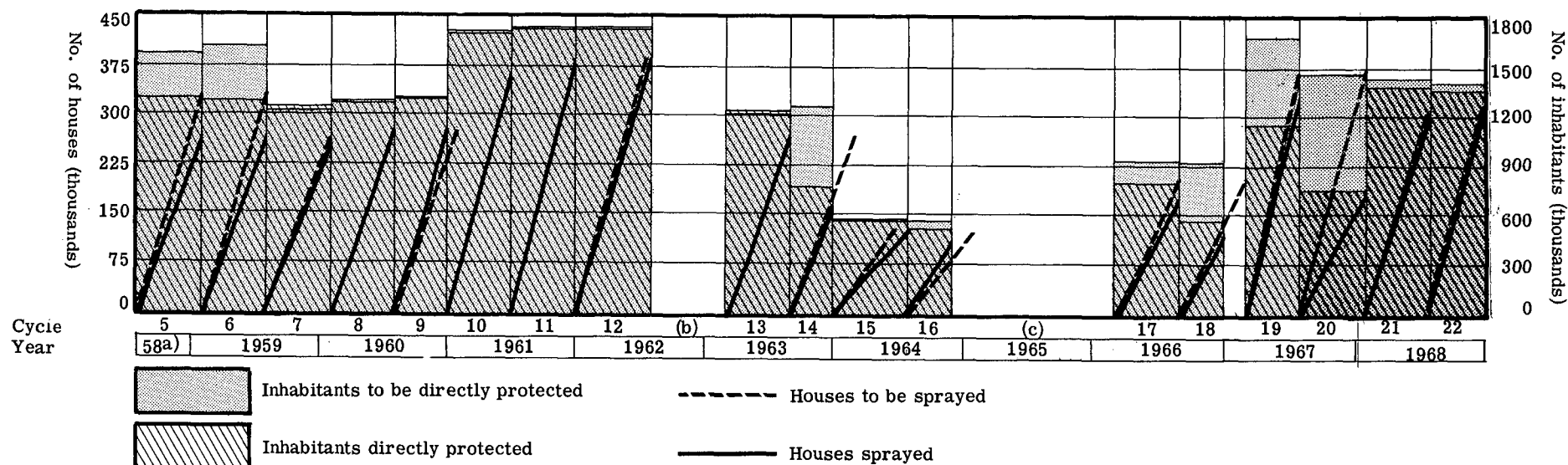
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	50	10	47	107
Two-wheel vehicles	-	20	112	132
Boats	1	-	4	5
Animals	-	-	-	-
Other	-	-	-	-
Total	51	30	163	244

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		
3rd	Aug. 58-Jul. 59a)	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-Dec. 65	(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-Jan. 68	19th	366 344	352 243	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	21th	318 723	314 556	1 441 928	1 402 421	588	8.6
		22th	324 888	318 418	1 454 112	1 409 950	562	9.4

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.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1957	29 171	6 661	22.8	3 001	3 655	5
1958	51 615	9 351	18.1	4 419	4 932	-
1959	71 295	17 521	24.6	4 051	13 470	-
1960	75 381	10 012	13.3	2 947	7 064	1
1961	127 293	12 563	9.9	2 965	9 594	4
1962	194 069	15 433	7.9	2 556	12 873	4
1963	238 791	17 846	7.5	1 879	15 962	5
1964	350 843	25 857	7.4	2 661	23 195	1
1965	506 442	34 070	6.7	2 186	31 884	-
1966	533 047	68 562	12.9	10 703	57 859	-
1967	535 494	82 960	15.5	7 226	75 734	-
1968	692 671	31 526	4.5	968	30 558	-

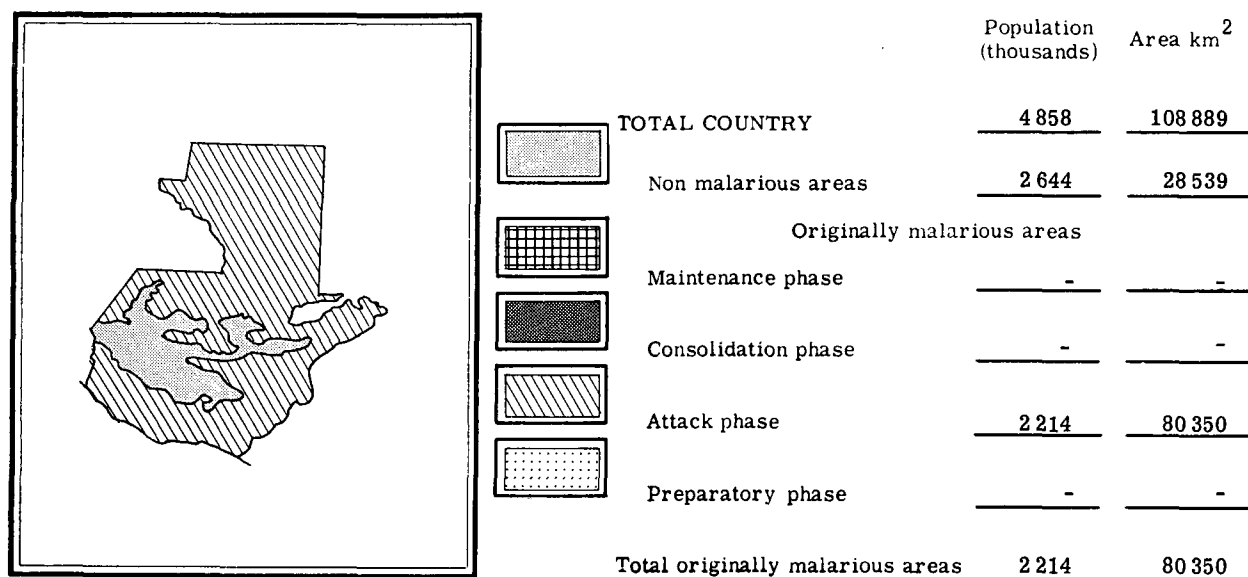
CONSOLIDATION PHASE AREAS

Date		Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive	Origin of infections							Species of parasite		
Year	Quarter					Autochthonous	Relapsing	Imported		Induced	Introduced	Not investigated and unclassified	<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
								from abroad	from areas within country						
1968 ^{a)}	1-4	505 ^{a)}	112 640	22.3	4 305	487	592	47	773	-	-	2 406	55	4 250	-

a) Beginning 1969 this area was brought back to attack phase.

GUATEMALA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	576	576
Evaluation operations	3	514	517
Administrative and other	-	105	105
Transport	-	70	70
Total	3	1 265	1 268

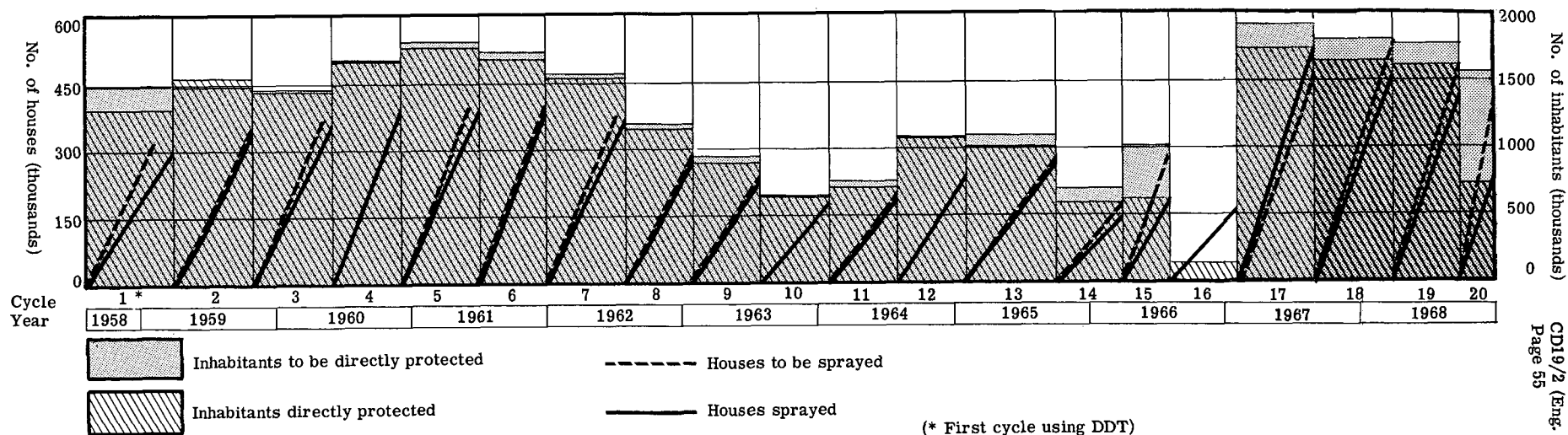
TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	70	11	65	146
Two-wheel vehicles	12	58	353	423
Boats	6	5	1	12
Animals	-	-	-	-
Other	8	5	9	22
Total	96	79	428	603

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. 56-Aug. 57	-	-	-	1st	308 097	306 306	1 361 175	1 353 121	-	117	8.4
2nd	Sep. 57-Sep. 58	-	-	-	2nd	321 975	331 090	1 422 165	1 462 510	-	117	8.5
3rd	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 636a	-	-	-	1 067 260	1 019 937	506	-	8.2
		14th	165 071	162 100b	-	-	-	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	17th	478 038	468 963	-	-	-	1 912 152	1 778 666	550	-	7.7
		18th	511 193	467 976	-	-	-	1 891 414	1 793 133	531	-	7.8
12th	Apr. 68-Dec. 68	19th	500 444	443 408	-	-	-	1 814 885	1 727 243	545	-	7.7
		20thc)	441 369	197 557	-	-	-	1 593 538	774 010	544	-	7.6

a) 115, 204 houses were sprayed in annual cycles and 3, 908 in emergency sprayings. b) Includes 5, 791 houses sprayed in emergency sprayings.
c) Cycle not yet finished.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1956 a)	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	216 217	12 270	5.7	4 660	7 565	45
1964	167 261	17 241	10.3	4 293	12 914	34
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	-

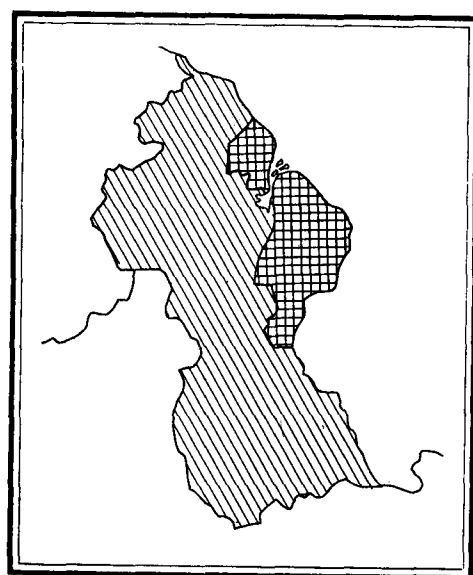
CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1962	1-4	581	48 370	8.3	213	2	-	-	100	-	-	111	62	151	-
1963	1st	890	20 834	9.4	297	-	2	-	144	-	-	151	68	229	-
	2nd	890	25 543	11.5	413	17	18	-	168	-	2	208	117	294	2
	3rd	1 234	40 400	13.1	1 082	89	64	-	169	-	-	760	359	723	-
	4th	1 234	45 372	14.7	1 054	72	58	-	73	-	-	851	353	699	2
1964	1st	1 009	26 989	10.7	454	64	122	-	134	-	-	134	67	385	2
	2nd	1 025	28 439	11.1	790	49	157	-	250	-	1	333	110	678	2
	3rd	1 025	30 529	11.9	941	-	-	-	-	-	-	941	180	759	2
	4th	1 057	35 840	13.6	975	41	56	-	127	-	-	751	353	622	-
1965	1st	1 057	36 831	13.9	656	58	142	-	38	-	-	418	58	598	-
	2nd	1 057	29 761	11.3	745	74	70	-	35	-	-	566	38	707	-
	3rd	887	31 344	14.1	676	36	24	-	17	-	-	599	76	599	1
	4th	887	40 614	18.3	665	128	36	-	21	-	-	480	88	577	-
1966	1st ^{b)}	845	24 393	11.5	674	81	29	1	9	-	-	554	38	636	-

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

GUYANA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	702	215 025
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	658	39 437
Consolidation phase	-	-
Attack phase	44	175 588
Preparatory phase	-	-
Total originally malarious areas	702	215 025

PERSONNEL

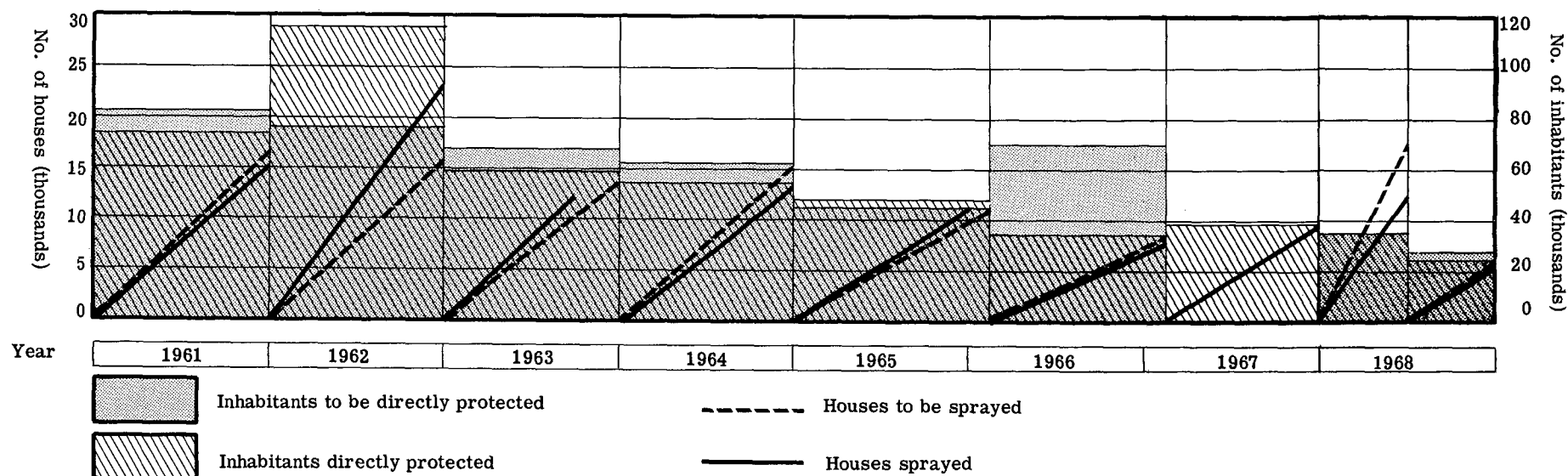
Activity	Professional	Non professional	Total
Spraying operations	-	32	32
Evaluation operations	5	24	29
Administrative and other	-	26	26
Transport	-	17	17
Total	5	99	104

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	2	4	1	7
Two-wheel vehicles	-	10	-	10
Boats	2	8	1	11
Animals	3	-	-	3
Other	-	-	-	-
Total	7	22	2	31

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	5 280	63 243	54 986	295	4.3
...	Jan. 65-Dec. 65	...	6 358	4 361	...	2 341	2 759	46 000	47 467	227	4.6
...	Feb. 66-Dec. 66	...	8 217	718	...	3 889	4 833	70 362	36 256	461	4.3
...	Feb. 67-Dec. 67	...	-	-	...	...	5 075	...	20 972	318	6.2
...	Jan. 68-Dec. 68	-	-	-	...	12 304	7 094	35 053	35 053	199	6.5
						5 979	5 414	27 723	22 606		



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958	1 520	51	3.34	23	8	20
1959	3 754	176 a)	4.68	53	100	13
1960	3 674	263	7.16	175	67	12
1961	15 515	218	1.40	57	156	5
1962	14 358	425	2.96	266	159	-
1963	16 780	473 a)	2.81	414	56	-
1964	35 091	223	0.64	190	33	-
1965	22 950	25	0.11	24	1	-
1966	14 098	17	0.12	15	2	-
1967	21 389	175	0.82	145	29	1
1968	32 064	44	0.13	20	24	-

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1965	1-4	26	15 500	59.6	1	1	-	-	-	-	-	-	-	1	-
1966	1-4	30	22 141	73.8	882	...	...	...	...	...	...	...	-	882	-

MAINTENANCE PHASE AREAS

1958	1-4	430	1	0.0	-	-	-	-	-	-	-	-	-	-	-
1959	1-4	460	-	0	-	-	-	-	-	-	-	-	-	-	-
1960	1-4	494	-	0	-	-	-	-	-	-	-	-	-	-	-
1961	1-4	515	1 374	0.3	13	-	-	1	12	-	-	-	1	12	-
1962	1-4	556	21 088	3.8	21	17	3	-	1	-	-	-	-	21	-
1963	1-4	572	15 475	2.7	3	-	2	1	-	-	-	-	1	2	-
1964	1-4	589	20 094	3.4	2	-	-	2	-	-	-	-	2	-	-
1965	1-4	602	23 057	3.8	2	-	-	1	-	-	1	-	2	-	-
1966	1-4	627	17 430	2.8	11	...	...	...	...	...	...	...	1	10	-
1967	1-4	637	12 774	2.0	-	-	-	-	-	-	-	-	-	-	-
1968	1-4	658	23 153	3.5	17	-	-	-	17	-	-	-	7	10	-

a) Includes undifferentiated mixed infections.

HAITI

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	4 674	27 750
Non malarious areas	1 174	8 750
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	3 500	19 100
Preparatory phase	-	-
Total originally malarious areas	3 500	19 100

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	218	220
Evaluation operations	9	1 100	1 109
Administrative and other	2	82	84
Transport	-	64	64
Total	13	1 464	1 477

TRANSPORT FACILITIES

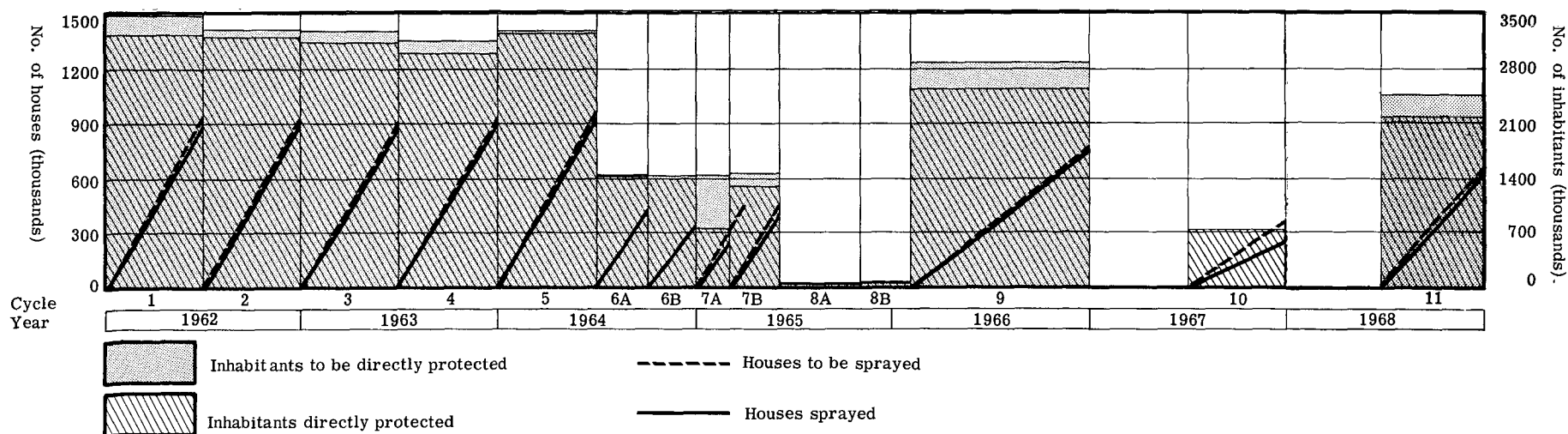
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	93	11	35	139
Two-wheel vehicles	-	-	-	-
Boats	2	-	-	2
Animals	-	-	-	-
Other	-	-	-	-
Total	95	11	35	141

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
		7th A ^{b)}	465 907	246 414	1 447 900	765 795	119	18. 3
4th	Jan. 65-Jan. 66	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
		9th	865 000	772 513	2 881 920	2 573 852	237	14. 8
5th	Feb. 66-Dec. 66	10th	360 049	233 513	...	720 525	295	15. 8
6th	Jul. 67-Dec. 67	11th	647 728	639 266	2 452 000	2 188 271	258	14. 8
		12th ^{f)}	124 808 ^{e)}	76 060	...	230 562	327	16. 6

a) 10, 016 houses were sprayed with dieldrin. b) Quarterly cycles, using DDT 1 g/m². c) Quarterly cycles, using DDT 2 g/m². d) Annual Cycles. e) Cycle not yet finished. f) Not shown in the graph.

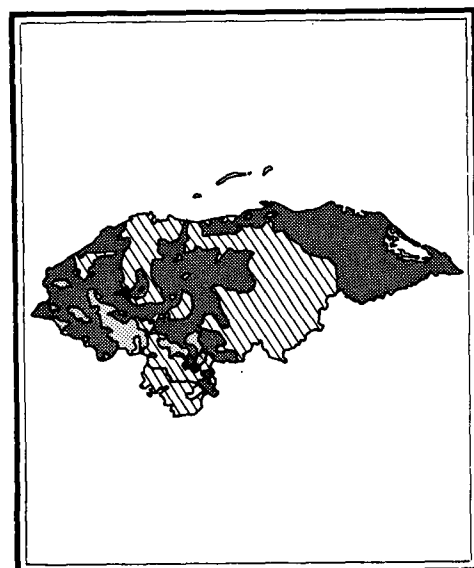


HAITI (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	2 325	112 088
Non malarious areas	296	10 721
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	1 124	55 731
Attack phase	905	45 636
Preparatory phase	-	-
Total originally malarious areas	2 029	101 367

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	256	257
Evaluation operations	3	484	487
Administrative and other	29	28	57
Transport	-	79	79
Total	33	847	880

TRANSPORT FACILITIES

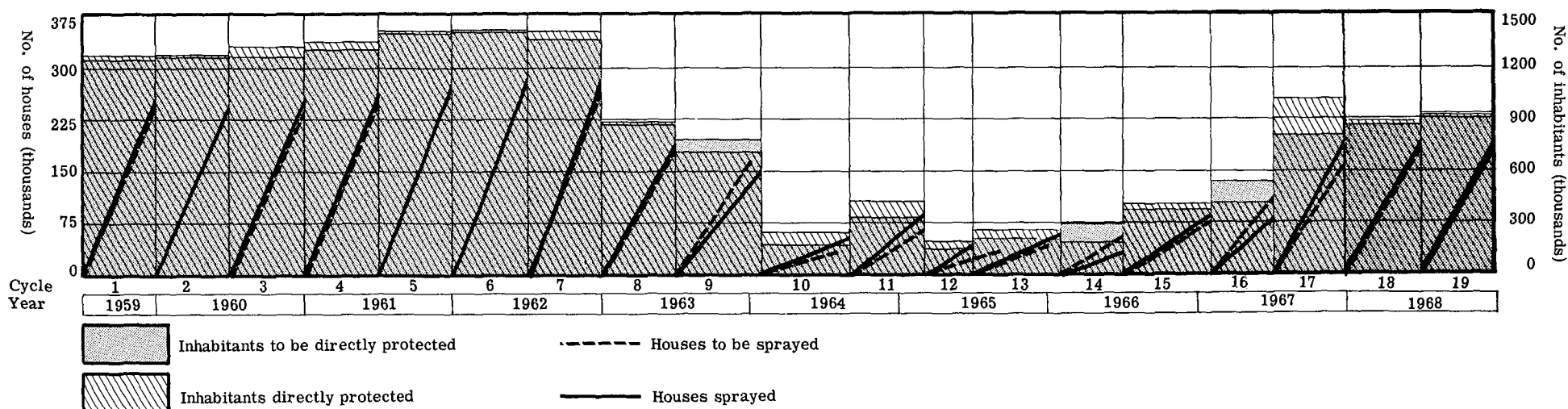
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	70	21	18	109
Two-wheel vehicles	71	43	-	114
Boats	-	-	4	4
Animals	36	107	-	143
Other	-	1	-	1
Total	177	172	22	371

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	232 771	236 963	-	-	-	1 252 773	1 275 237	406	-	9. 8
		2nd	241 726	242 059	-	-	-	1 277 280	1 279 148	368	-	11. 4
2nd	Jul. 60- Jun. 61	3rd	245 572	254 699	-	-	-	1 274 028	1 321 450	369	-	11. 8
		4th	258 519	265 825	-	-	-	1 314 052	1 351 212	419	-	10. 9
3rd	Jul. 61- Jun. 62	5th	276 458	277 941	-	-	-	1 401 919	1 409 325	360	-	11. 1
		6th	287 516	285 394	-	-	-	1 421 192	1 410 773	262	-	11. 3
4th	Jul. 62- Jun. 63	7th	282 186	290 056	-	-	-	1 376 785	1 415 286	373	-	11. 1
		8th	187 905	191 321	-	-	-	877 892	893 861	377	-	11. 0
5th	Jul. 63- Aug. 64	9th	126 499	110 612	1st	19 776	20 440	781 085	712 355	404	440	10. 5
		10th	14 851	27 719	2nd	17 471	18 286	781 085	712 355	404	343	
					3rd	21 499	23 066	171 805	240 031	505	575	9. 0
6th	Sep. 64- Jun. 65	11th	21 502	37 818	4th	23 274	23 614	328 950	425 513	567	550	8. 4
		12th	30 377	35 603	5th	22 039	24 997	328 950	425 513	567	411.	8. 7
7th	Jul. 65- Jun. 66	13th	38 035	54 654	-	-	-	137 790	161 522	474	-	8. 9
		14th	59 178	38 187	-	-	-	182 636	262 338	464	-	8. 8
8th	Jul. 66- Jun. 67	15th	76 185	79 491	-	-	-	291 630	188 187	481	-	8. 4
		16th	113 469	83 915	-	-	-	375 410	391 701	441	-	8. 2
9th	Jul. 67- Jun. 68	17th	164 594	189 567	-	-	-	544 651	410 160	490	-	7. 4
		18th	181 273	181 190 a)	-	-	-	806 510	1 015 546	500	-	8. 5
10th	Jul. 68- Dec. 68	19th	186 143	186 861 a)	-	-	-	891 863	891 903 a)	475	-	8. 5
					-	-	-	915 823	918 403 a)	482	-	

a) In addition, 14,017 houses were sprayed and 69,002 inhabitants were protected in emergency sprayings.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958 ^{a)}	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	-

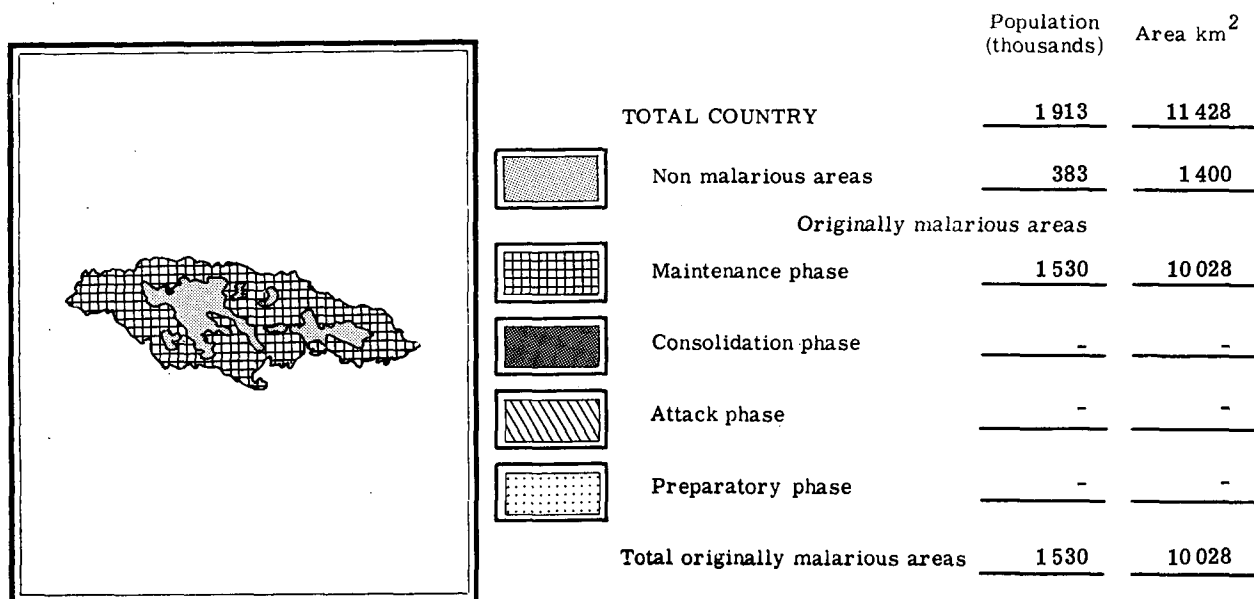
CONSOLIDATION PHASE AREAS

Date		Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive	Origin of infections							Species of parasite		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1962	3-4	46	9 989	43.4	3	-	1	-	2	-	-	-	-	-	-
1963	1-4	941	95 484	10.1	356	177	51	1	84	-	-	43	19	337	-
1964	1-4	1 631	131 696	8.1	1 281	711	258	-	143	-	-	169	37	1 244	-
1965	1-4	1 518	196 538	13.0	1 870	1 010	222	32	111	-	-	495	22	1 848	-
1966	1st	1 563	51 402	13.1	1 328	399	63	-	39	-	-	827	3	1 325	-
	2nd		57 296	14.7	898	271	68	-	24	-	-	535	1	897	-
	3rd		47 339	12.1	886	330	45	10	50	-	-	451	8	878	-
	4th		39 202	10.0	704	178	17	6	43	-	-	460	46	658	-
1967	1st	1 091	39 107	14.3	347	184	31	10	57	-	-	65	17	330	-
	2nd		38 538	14.1	680	285	91	22	132	-	-	150	10	670	-
	3rd		45 458	16.7	452	206	49	10	67	-	-	120	6	446	-
	4th		45 997	16.8	349	139	52	5	48	-	-	105	7	342	-
1968	1st	1 124	47 788	17.0	356	142	24	10	61	-	-	119	7	349	-
	2nd		55 131	19.6	348	124	35	5	78	-	-	106	32	316	-
	3rd		60 100	21.4	745	431	68	11	55	-	-	180	103	642	-
	4th		62 003	22.1	880	318	20	5	48	-	-	489	242	638	-

a) Incomplete information.

JAMAICA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	-	-
Evaluation operations	16(1)	62	78(1)
Administrative and other	-	21	21
Transport	-	37	37
Total	16(1)	120	136(1)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	12	26	38
Two-wheel vehicles	-	-	-	-
Boats	-	-	2	2
Animals	-	-	-	-
Other	-	-	-	-
Total	-	12	28	40

(Part-time personnel in parentheses)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958	56 266	205	0.4	199	-	6
1959	39 726	371	0.9	352	-	19
1960	136 123	133	0.1	122	-	11
1961	153 237	23	0.02	16	-	7

CONSOLIDATION PHASE AREAS

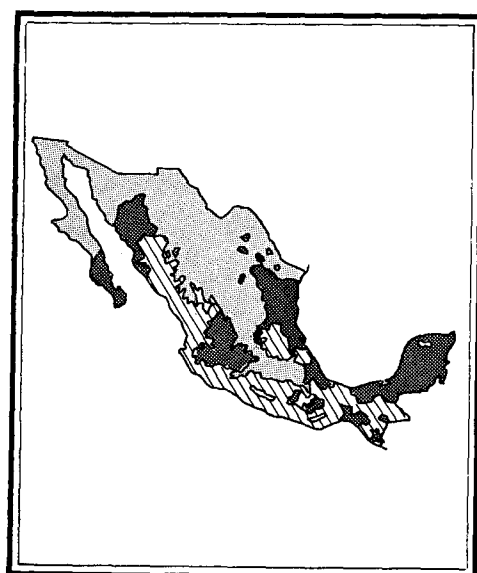
Date		Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1960	3-4	313	48 411	30.9	2	-	2	-	-	-	-	-	-	-	2
1961	1-4	761	139 664	18.4	8	1	7	-	-	-	-	-	-	-	8
1962	1-4	1 282	246 592	19.2	2	-	-	1	-	1	-	-	-	1	1
1963	1-4	1 309	185 459	14.2	3	-	3	-	-	-	-	-	-	-	3
1964	1-4	1 365	134 824	9.9	1	-	1	-	-	-	-	-	-	-	1
1965	1st	1 432	24 443	6.8	1	-	1	-	-	-	-	-	-	-	1

MAINTENANCE PHASE AREAS

1965	2-4	1 432	53 854	5.0	2	-	1	1	-	-	-	-	-	-	2
1966	1-4	1 471	123 799	8.4	2	-	-	2	-	-	-	-	2	-	-
1967	1-4	1 500	122 007	8.1	2	-	-	2	-	-	-	-	1	1	-
1968	1-4	1 530	99 581	6.5	2	-	-	2	-	-	-	-	1	1	-

MEXICO

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	45 176	1 967 183
Non malarious areas	22 778	817 183
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	13 574	574 565
Attack phase	8 824	575 435
Preparatory phase	-	-
Total originally malarious areas	22 398	1 150 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	35	2 371	2 406
Evaluation operations	61	193	254
Administrative and other	15	639	654
Transport	-	141	141
Total	111	3 344	3 455

TRANSPORT FACILITIES

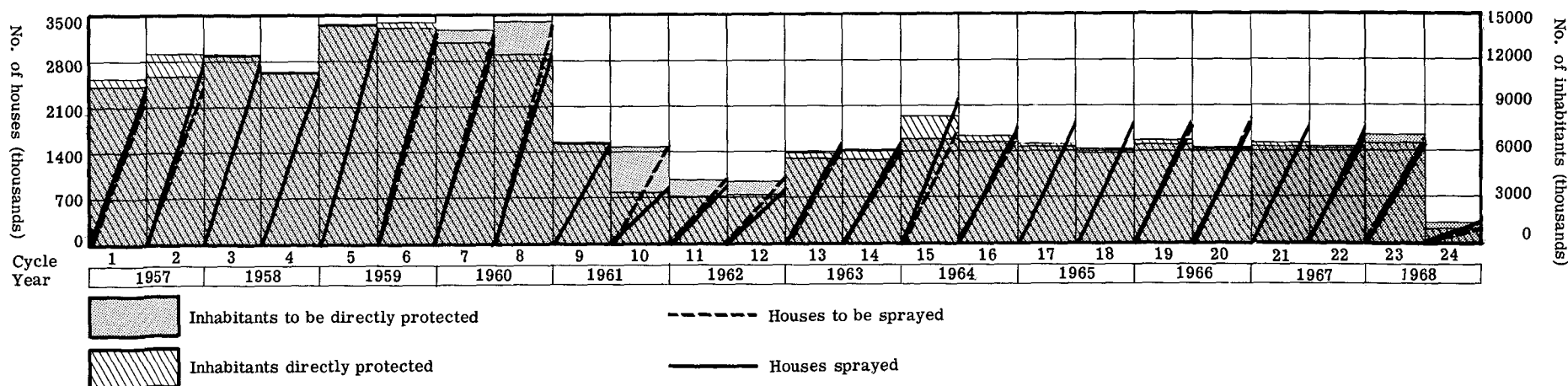
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	377	363	128	868
Two-wheel vehicles	-	-	-	-
Boats	-	-	18	18
Animals	1 256 ^{a)}	661	153	2 070
Other	-	-	-	-
Total	1 633	1 024	299	2 956

a) Property of the users, CNEP only pays for their maintenance.

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	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	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	(a)	68 977	14 163 856	13 301 924	369	94	10.9
		8th	3 376 695	2 869 083			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

a) Included in DDT column. b) Including houses sprayed once and 3 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.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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 a)	10 054 a)	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

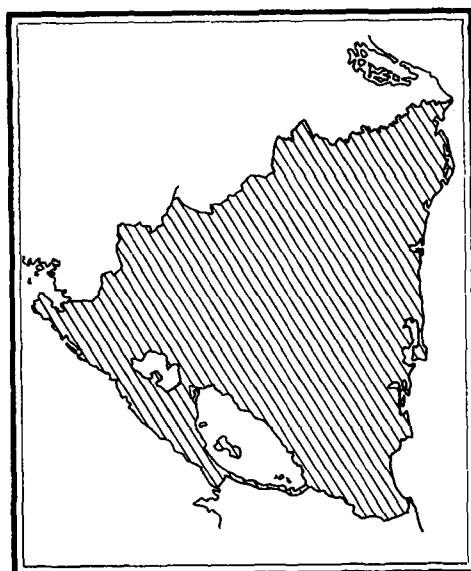
CONSOLIDATION PHASE AREAS

Date		Estimated population in the area (thousands)	No. of slides examined	% of population sampled (annual rate)	Total No. of positive	Origin of infections							Species of parasite		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>p. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1958	1-4	59	4 449	7.5	-	-	-	-	-	-	-	-	-	-	-
1959	1-4	59	6560	11.1	-	-	-	-	-	-	-	-	-	-	-
1960	1-3	70	4 058	7.7	-	-	-	-	-	-	-	-	-	-	-
1961	1-4	11721	745 907	6.4	3 114	1248	446	387	-	12	90	931	91	3 004	19
1962	1-4	15 592	1 240 130	7.9	4 367	1 211	487	3	695	2	642	1 597	43	4 577	17
1963	1-4	16 830	1 122 103	6.7	3 835	1 514	73	1	494	5	390	1 358	183	3 634	18
1964	1-4	12 740	833 491	6.5	1 683	914	78	2	407	4	11	267	83	1 595	5
1965	1-4	12 995	808 202	6.2	1 554	601	30	9	298	-	21	595	26	1 527	1
1966	1-4	12 794	709 154	5.5	1 158	579	132	6	231	2	2	206	1	1 155	2
1967	1-4	13 357	675 708	5.1	1 648	716	336	17	351	2	15	211	3	1 642	3
1968	1-4	13 574	988 165	7.3	3 554	2 128	407	3	380	15	8	613	4	3 535	15

a) Including 58,269 slides with 188 positives from non-malarious areas adjoining areas under attack phase.

NICARAGUA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	1818	127 358
Non malarious areas	-	9 000
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	1818	118 358
Preparatory phase	-	-
Total originally malarious areas	1818	118 358

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	336	338
Evaluation operations	5	680	685
Administrative and other	2	89	91
Transport	-	120	120
Total	9	1 225	1 234

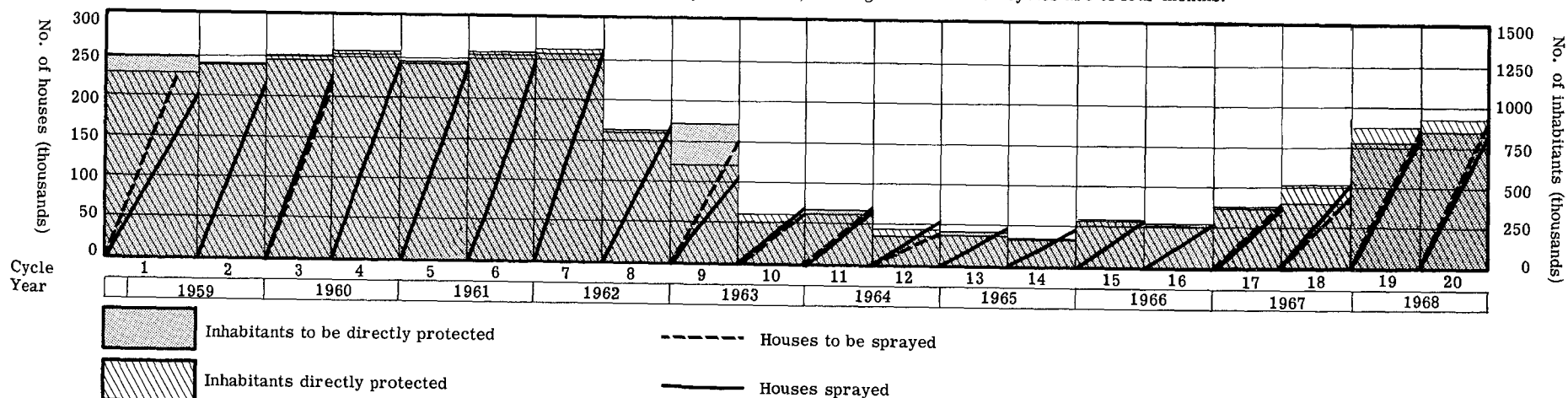
TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	95	3	2	100
Two-wheel vehicles	155	25	-	180
Boats	-	-	36	36
Animals	-	-	-	-
Other	-	-	-	-
Total	250	28	38	316

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	223 220	205 930	-	-	-	1 244 452	1 148 052	401	-	9.2
		2nd	218 312	218 645	-	-	-	1 202 244	1 204 139	325	-	10.3
2nd	Jan. 60-Dec. 60	3rd	226 831	230 478	-	-	-	1 232 373	1 252 160	376	-	9.4
		4th	237 553	239 076	-	-	-	1 275 185	1 283 375	396	-	8.9
3rd	Jan. 61-Dec. 61	5th	237 062	239 375	-	-	-	1 244 338	1 256 399	403	-	9.5
		6th	248 739	249 068	-	-	2 469	1 276 530	1 290 900	396	410	9.2
4th	Jan. 62-Dec. 62	7th	259 760	259 743	(a)	...	5 079	1 289 708	1 314 866	409	309	9.6
		8th	163 746	164 623	(a)	5 372	5 710	821 913	827 823	440	399	9.3
5th	Jan. 63-Dec. 63	9th	170 580	115 023	(a)	5 958	11 460	863 624	618 699	465	420	9.0
		10th	55 574	59 876	(a)	9 320	11 356	279 693	306 925	471	439	9.0
6th	Jan. 64-Dec. 64	11th	65 151	55 884	(a)	9 445	12 098	337 690	307 741	491	473	8.3
		12th	34 068	37 139	(a)	11 375	16 925	187 480	223 046	493	409	7.7
7th	Jan. 65-Dec. 65	13th	32 752	33 998	(a)	14 817	12 653	206 178	202 201	476	429	7.9
		14th	33 124	30 010	(a)	11 343	14 953	189 793	191 910	436	425	8.5
8th	Jan. 66-Dec. 66	15th	39 458	38 452	(a)	18 844	18 239	275 698	268 086	423	362	8.3
		16th	35 808	36 793	(a)	18 844	16 447	261 914	255 149	420	380	8.3
9th	Jan. 67-Dec. 67	17th	59 766	56 652	(a)	19 203	17 634	379 051	376 386	414	374	8.4
		18th	67 305	86 055	(a)	19 203	17 081	415 238	518 110	410	375	8.3
10th	Jan. 68-Dec. 68	19th	167 413	136 694	(a)	19 702	16 168	787 899	932 662	429	384	8.2
		20th	178 831	171 831	(a)	20 756	19 735	862 107	964 796	403	282	8.8

a) The date of the cycles of malathion are in agreement with the cycles of DDT, although the malathion cycles are of four months.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

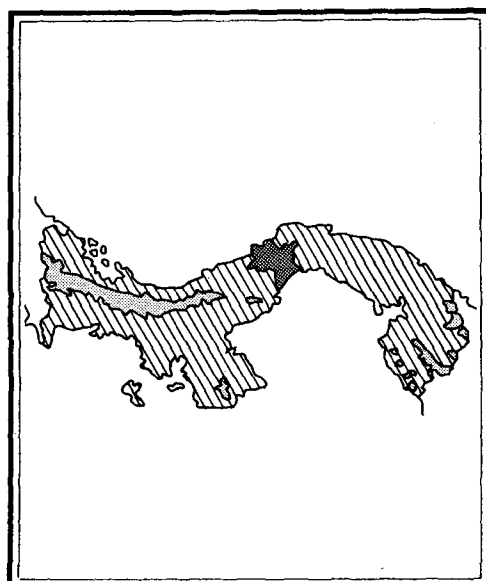
Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958	23 982	890	3.7	...	...	...
1959	38 966	1 875	4.8	619	1 256	-
1960	74 074	7 528	10.2	4 217	3 311	-
1961	109 293	8 722	8.0	3 001	5 721	-
1962	162 733	11 200	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	-

CONSOLIDATION PHASE AREAS

Date		Estimated population in the area (thousands)	No. of slides examined	% of popu- lation sampled (annual rate)	Total No. of positive cases	Origin of infections							Species of parasite		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1962	3-4	515	18 994	7.4	159	57	13	-	50	-	1	38	26	132	1
1963	1-4	668	62 511	9.4	966	494	39	-	230	1	3	199	478	488	-
1964	1st	695	17 564	10.1	343	200	33	-	45	-	-	65	169	174	-
	2nd		19 395	11.2	362	105	27	-	84	-	-	146	101	261	-
	3rd		21 520	12.4	527	143	42	-	86	1	-	255	87	440	-
	4th		16 064	9.2	587	206	38	-	149	-	1	193	149	438	-
1965	1st	730	18 122	9.9	422	268	25	-	108	-	5	16	75	347	-
	2nd		17 443	9.6	393	121	7	-	131	-	1	133	44	349	-
	3rd		15 067	8.3	347	79	94	-	140	-	-	34	18	329	-
	4th		18 310	10.0	443	100	95	-	79	-	-	169	17	426	-
1966	1st	665	13 981	8.4	261	604	90	-	143	-	-	915	15	246	-
	2nd		15 789	9.5	445								16	429	-
	3rd		17 106	10.3	670								12	658	-
	4th		10 160	6.1	376								40	336	-

PANAMA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	1 372	75 650
Non malarious areas	55	5 810
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	1 317	69 840
Preparatory phase	-	-
Total originally malarious areas	1 317	69 840

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	242	243
Evaluation operations	1	49(3)	50(3)
Administrative and other	1	33	34
Transport	-	15	15
Total	3	339(3)	342(3)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	56	16	12	84
Two-wheel vehicles	-	6	-	6
Boats	28	3	-	31
Animals	5	-	-	5
Other	-	-	-	-
Total	89	25	12	126

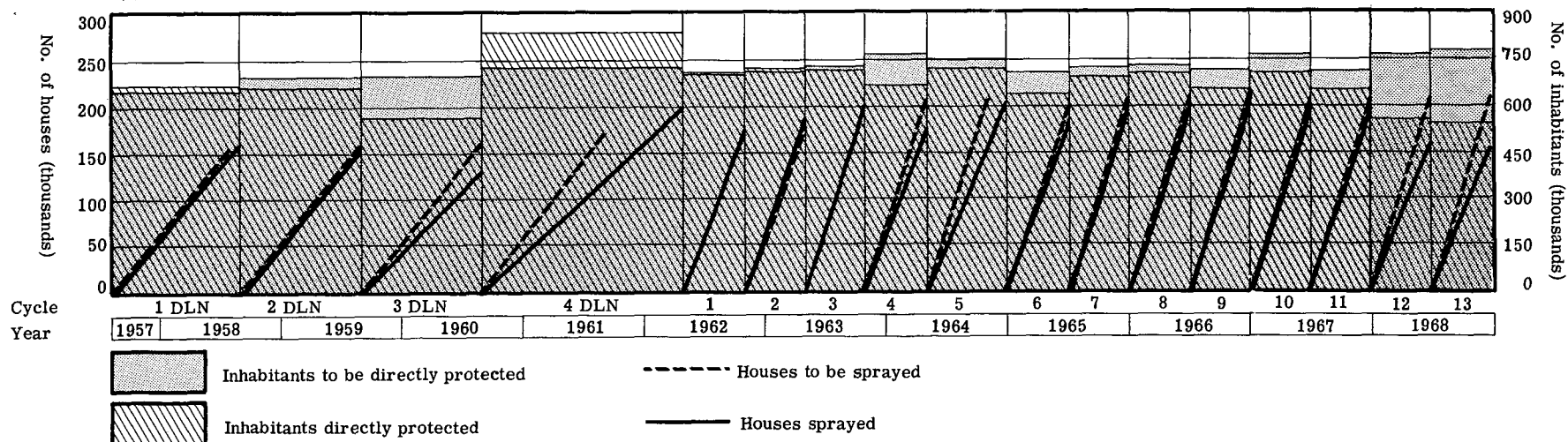
(Part-time personnel in parentheses)

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-Dec. 68	13th	207 214	165 285	-	-	-	766 692	563 486	423	-	7.0	

(a) Estimated. (b) Included in DDT column. (c) Sprayed twice a year with 0.3 g/m².



PANAMA (Cont.)

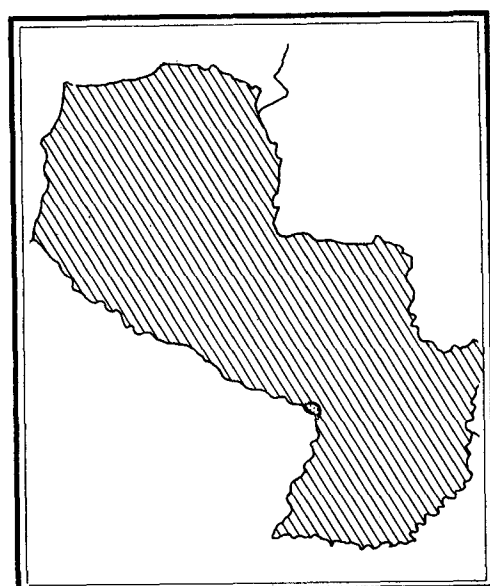
EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1957 ^{a)}	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	-

a) August-December.

PARAGUAY

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	2 331	406 752
Non malarious areas	230	200
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	-	-
Attack phase	2 101	406 552
Preparatory phase	-	-
Total originally malarious areas	2 101	406 552

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	469	471
Evaluation operations	1	75(6)	76(6)
Administrative and other	-	83	83
Transport	-	84	84
Total	3	711(6)	714(6)

TRANSPORT FACILITIES

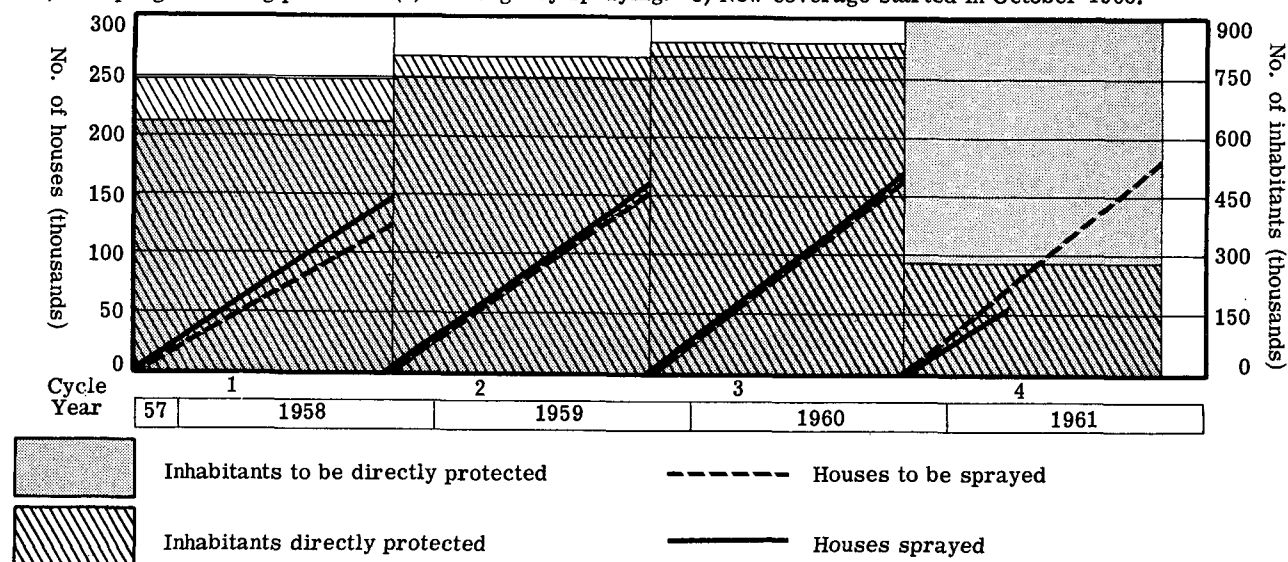
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	88	4	30	122
Two-wheel vehicles	-	9	18	27
Boats	14	-	-	14
Animals	8	-	-	8
Other	-	-	-	-
Total	110	13	48	171

(Part-time personnel in parentheses)

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	-	-	-	-	-	5 631	-	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
(b)	Jan. 68-May. 68	-	-	1 265	-	-	-	-	5 502	706	-	5. 4
1st ^{c)}	Oct. 68-Dec. 68	1st	330 000	138 627	-	-	-	2 101 024	654 108	510	-	7. 1

(a) Program suspended, new program being planned. (b) Emergency spraying. c) New coverage started in October 1968.



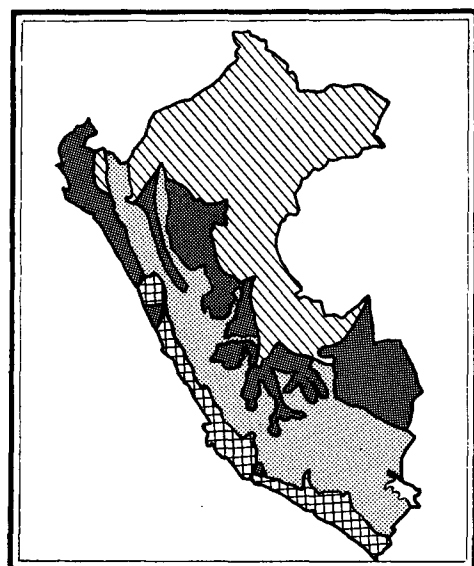
PARAGUAY (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958	14 359	526	3.7	...	...	...
1959	11 379	641	5.6	1	640	-
1960	47 045	1 165	2.4	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	-

PERU

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	12 778	1 285 216
Non malarious areas	8 318	324 044
Originally malarious areas		
Maintenance phase	1 112	84 497
Consolidation phase	2 184	327 685
Attack phase	1 164	548 990
Preparatory phase	-	-
Total originally malarious areas	4 460	961 172

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	4	193	197
Evaluation operations	10	278	288
Administrative and other	7	79	86
Transport	1	76	77
Total	22	626	648

TRANSPORT FACILITIES

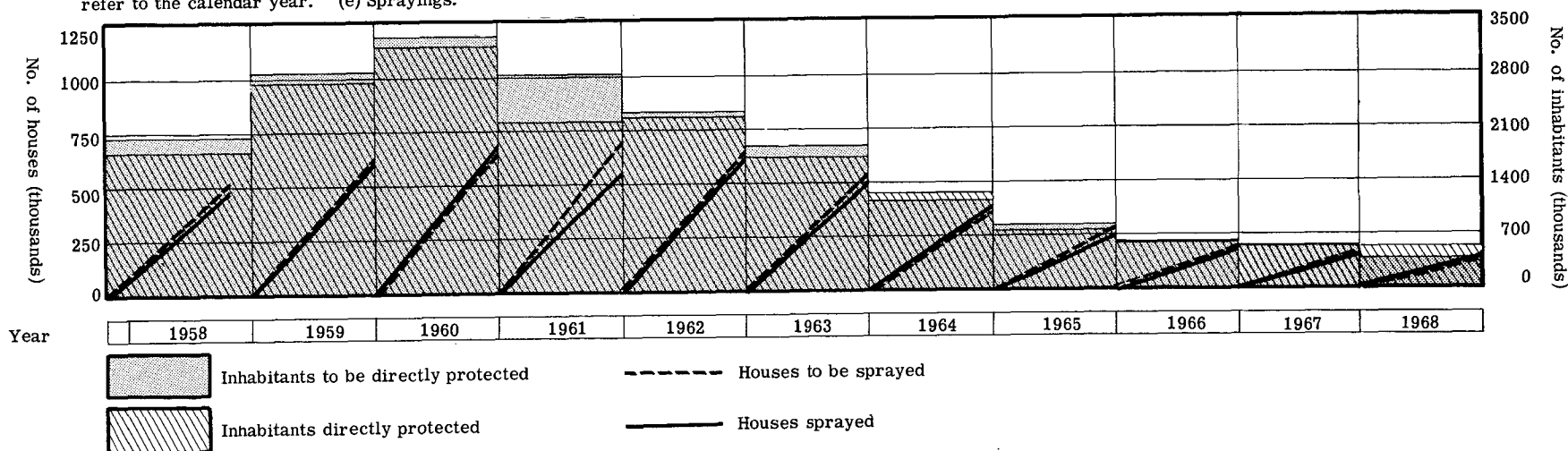
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	10	79	44	133
Two-wheel vehicles	-	-	-	-
Boats	43	40	33	116
Animals	-	-	-	-
Other	-	-	-	-
Total	53	119	77	249

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

(a) Sprayed once a year. (b) Sprayed twice a year. (c) Included in DDT column. (d) Owing to different spray cycle timing in different regions, these data refer to the calendar year. (e) Sprayings.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958 ^{a)}	...	649 ^{b)}	...	77	526	27
1959	148 413	4658 ^{b)}	3.1	302	4 265	51
1960	342 503	3901	1.1	256	3 559	86
1961	403 748	3055	0.8	185	2 804	66
1962	399 309	2196	0.6	81	2 035	80
1963	313 649	1630	0.5	101	1 389	140
1964	308 283	1613	0.5	301	1 222	90
1965	280 449	1508	0.5	113	1 315	80
1966	266 237	1785	0.7	32	1 663	90
1967	198 340	2689	1.4	105	2 512	72
1968	129 951	1970	1.5	51	1 875	44

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1959	1-4	14	1 378	9.8	-	-	-	-	-	-	-	-	-	-	-
1960	1-4	15	7 277	48.5	5	-	-	1	-	4	-	-	-	1	4
1961	1-4	47	13 780	29.3	1	-	-	-	1	-	-	-	-	-	-
1962	1-4	864	71 330	8.3	20	2	1	1	12	4	-	-	1	16	3
1963	1-4	2 199	168 727	7.7	87	13	6	5	51	3	-	9	-	83	4
1964	1-4	2 204	186 205	8.4	321	209	45	-	25	2	3	37	1	316	4
1965	1-4	2 334	165 388	7.1	367	209	50	1	6	1	-	100	13	349	5
1966	1-4	1 962	138 634	7.1	233	87	39	-	14	1	-	92	-	233	-
1967	1-4	1 992	112 753	5.7	80	58	1	1	6	-	4	10	-	78	2
1968	1-4	2 184	85 336	3.9	34	10	6	1	9	1	-	7	1	31	2

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

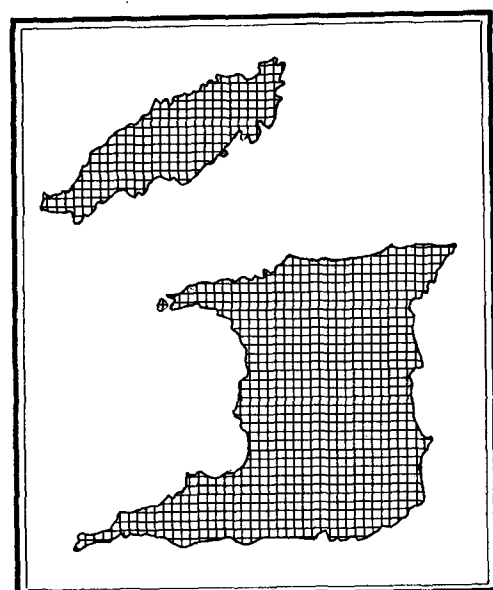
PERU (Cont.)

MAINTENANCE PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1963	1-4	43	8 581	20.0	4	-	-	1	1	2	-	-	-	2	2
1964	1-4	43	8 256	19.2	-	-	-	-	-	-	-	-	-	-	-
1965	1-4	46	6 260	13.6	2	-	-	-	-	2	-	-	-	-	2
1966	1-4	1 044	20 032	1.9	7	-	-	1	3	1	-	2	-	5	2
1967	1-4	1 058	30 738	2.9	3	-	-	-	2	1	-	-	-	1	2
1968	1-4	1 112	31 829	2.9	6	-	-	-	1	2	-	3	-	5	1

TRINIDAD AND TOBAGO

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	1 036	5 605
Non malarious areas	151	161
Originally malarious areas		
Maintenance phase	885	5 444
Consolidation phase	-	-
Attack phase	-	-
Preparatory phase	-	-
Total originally malarious areas	885	5 444

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	4	115	119
Evaluation operations	13	110	123
Administrative and other	2	21	23
Transport	-	10	10
Total	19	256	275

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	2	8	-	10
Two-wheel vehicles	-	-	-	-
Boats	-	-	-	-
Animals	-	-	-	-
Other	-	-	-	-
Total	2	8	-	10

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958	51 159	374	0.7	316	58	-
1959	101 039	92	0.1	63	28	1
1960	91 388	11	0.01	9	2	-
1961	89 569	-	-	-	-	-

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1958	1-4	160	21 279	13.2	2	-	-	2	-	-	-	-	2	-	-
1959	1-4	160	361	0.2	5	-	-	5	-	-	-	-	4	1	-
1960	1-4	185	17 612	9.5	2	-	-	2	-	-	-	-	1	1	-
1961	1-4	197	11 602	5.9	1	-	-	1	-	-	-	-	1	-	-
1962	1-4	877	120 967	13.8	1	-	-	1	-	-	-	-	-	1	-
1963	1-4	828	108 388	13.1	-	-	-	-	-	-	-	-	-	-	-
1964	1-4	822	82 038	10.0	3	-	1	2	-	-	-	-	-	1	2

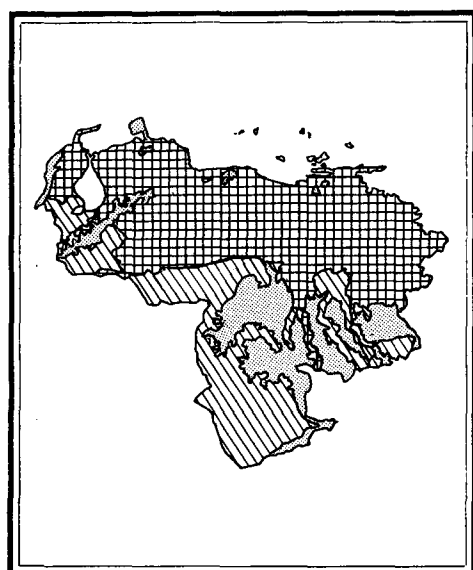
MAINTENANCE PHASE AREAS

1965 ^a	1-4	846	58 922	7.6	2	-	-	2	-	-	-	-	2	-	-
1966	1-4	872	89 156	10.2	40	38	1	1	-	-	-	-	1	-	39
1967	1-4	872	74 255	8.5	0	-	-	-	-	-	-	-	-	-	-
1968	1-4	885	65 757	7.4	5	-	1	4	-	-	-	-	4	-	1

(a) January-November.

VENEZUELA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	9 307	912 050
Non malarious areas	2 374	312 050
Originally malarious areas		
Maintenance phase	6 545	461 259
Consolidation phase	-	-
Attack phase	388	138 741
Preparatory phase	-	-
Total originally malarious areas	6 933	600 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	2	470	472
Evaluation operations	24	673	697
Administrative and other	(a)	(a)	(a)
Transport	(a)	(a)	(a)
Total	26	1 143	1 169

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	127	144	-	271
Two-wheel vehicles	36	315	-	351
Boats	36	88	-	124
Animals	300	335	-	635
Other	36 ^{b)}	-	-	36 ^{b)}
Total	535	882	-	1 417

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

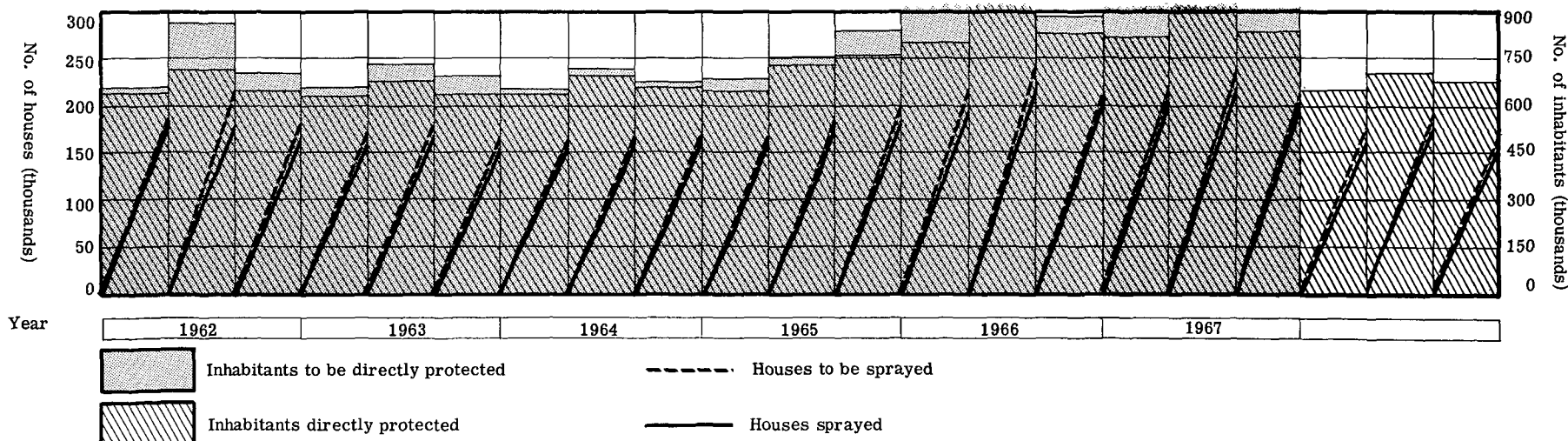
b) Fogging machines.

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	...	189 083	170 848	...	(b)	16 506	712 276	643 634	422	198	6. 3
		...	220 919	175 962	...	(b)	6 804	877 711	726 147	340	210	6. 5
		...	185 755	163 477	...	(b)	6 472	715 343	654 399	332	247	7. 0
...	Jan. 63-Dec. 63	...	177 294	158 263	...	(b)	940	712 190	639 525	359	198	7. 0
		...	179 385	163 952	...	(b)	2 031	739 963	684 615	376	322	7. 0
		...	169 947	153 538	...	(b)	1 141	703 241	640 057	370	303	7. 0
...	Jan. 64-Dec. 64	...	165 656	160 867 ^{a)}	...	(b)	(b)	659 840 ^{c)}	640 780	373	...	7. 4
		...	174 388	169 599 ^{a)}	...	(b)	(b)	727 564 ^{c)}	707 599	391	...	7. 5
		...	165 206	160 418 ^{a)}	...	(b)	(b)	681 949 ^{c)}	662 186	389	...	7. 0
...	Jan. 65-Dec. 65	...	167 200 ^{c)}	159 854 ^{a)}	-	-	-	685 352 ^{c)}	655 241	-	-	7. 0
		...	185 950 ^{c)}	177 758 ^{a)}	-	-	-	762 209 ^{c)}	728 630	394	-	7. 0
		...	200 068	185 004 ^{a)}	-	-	-	832 202	769 558	449	-	7. 0
...	Jan. 66-Dec. 66	...	216 632	190 543 ^{a)}	-	-	-	911 370	801 645	424	-	6. 5
		...	242 706	219 118	-	-	-	1 022 520	923 128	407	-	7. 0
		...	216 998	202 004	-	-	-	891 666	830 071	366	-	6. 7
...	Jan. 67-Dec. 67	...	222 438	203 993	-	-	-	934 240	828 284	375	-	7. 0
		...	237 827	216 736	-	-	-	998 873	903 658	367	-	7. 3
		...	215 291	203 197	-	-	-	904 222	846 509	376	-	7. 3
...	Jan. 68-Dec. 68	...	171 366	161 363	-	-	-	...	648 423	447	-	6. 5
		...	190 013	174 585	-	-	-	...	715 685	470	-	6. 5
		...	182 495	169 504	-	-	-	...	675 244	479	-	6. 0

a) Including houses sprayed with BHC or lindane. b) Included in DDT column. c) Estimated.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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 c)	267 227	3 448	1.3	152	3 294	2
1966 c)	294 602	3 935	1.3	465	3 431	39
1967	249 057	4 281	1.7	940	3 323	18
1968 c) d)	201 568	5 555	2.8	1 511	3 989	55

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1958	1-4	469	69 614	14.8	50	-	-	27		-	23	-	2	46	2
1959	1-4	685	101 878	14.9	45	-	-	37		1	7	-	2	43	-
1960	1-4	291	93 047	32.0	112 a)	-	2	31	45	1	33	-	-	108	2
1961	1-4	174	64 923	37.3	57	-	4	15	9	-	29	-	-	57	-
1962	1-4	150	93 646	62.4	74 a)	-	1	29	7	-	37	-	22	51	-
1963	1-4	102	61 724	60.5	89 a)	-	-	32	7	-	50	-	26	62	-
1964	1-4	99	58 605	59.2	74	-	-	15	9	-	50	-	-	74	-
1965	1-3	132	41 227	41.6	20	-	-	11	3	-	6	-	10	10	-
1966	1-3	67	31 766	63.2	33	-	-	14	9	-	10	-	6	27	-
1967	1-4	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) Data for last quarter, not separated by phases. d) In 1968 areas in consolidation were reclassified to attack phase.

VENEZUELA (Cont.)

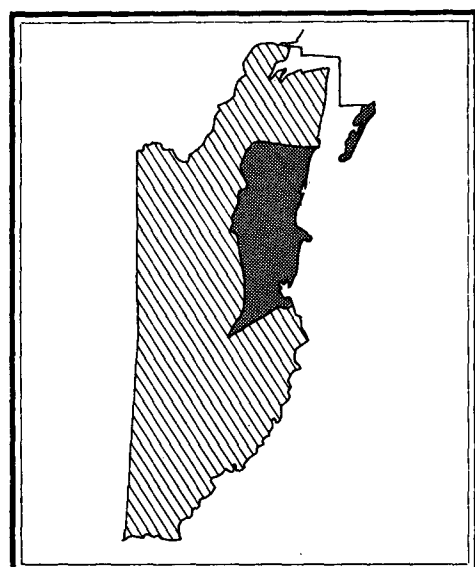
MAINTENANCE AND NON-MALARIOUS AREAS

Date		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			
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1958	1-4	4 720	145 654	3.1	113 ^{a)}	-	-	79		5	28	1	6	100	6
1959	1-4	5 097	169 189	3.3	101 ^{a)}	-	-	87		6	7	1	14	73	9
1960	1-4	6 092	224 193	3.7	216 ^{a)}	-	6	44	92	4	70	-	14	197	4
1961	1-4	7 111	305 252	4.3	522 ^{a)}	-	11	52	122	4	333	-	13	498	5
1962	1-4	7 410	282 314	3.8	253 ^{a)}	-	5	52	84	2	110	-	5	244	3
1963	1-4	7 701	284 814	3.7	570	-	-	79	286	3	202	-	6	562	2
1964	1-4	7 973	317 731	4.0	1 862 ^{a)}	- ^{b)}	1 ^{b)}	180 ^{b)}	1 076 ^{b)}	1 ^{b)}	339 ^{b)}	-	12	1 846	2
1965	1-3	8 205	236 588	3.8	1 875	-	-	81	805	5	984	-	70	1 780	25
1966	1-3	8 500	274 727	4.3	1 502 ^{c)}	-	-	110	802	1	588	-	42	1 454	6
1967	1-4	8 772	373 853	4.3	942	-	1	79	611	3	248	-	77	861	4
1968	1-4	6 545 ^{b)}	325 885	5.0	180 ^{b)}	16 ^{b)}	-	42 ^{b)}	87 ^{b)}	2 ^{b)}	32 ^{b)}	1 ^{b)}	20 ^{b)}	155 ^{b)}	5 ^{b)}

a) Includes undifferentiated mixed infections. b) Maintenance phase only. c) Including one cryptic case.

BRITISH HONDURAS

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	119	22 965
Non malarious areas	-	-
Originally malarious areas		
Maintenance phase	-	-
Consolidation phase	48	4 307
Attack phase	71	18 658
Preparatory phase	-	-
Total originally malarious areas	119	22 965

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	25	25
Evaluation operations	(1)	12	12(1)
Administrative and other	-	3	3
Transport	-	2	2
Total	(1)	42	42(1)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	4	8	1	13
Two-wheel vehicles	-	3	-	3
Boats	1	8	-	9
Animals	-	-	-	-
Other	-	-	-	-
Total	5	19	1	25

(Part-time personnel in parentheses)

BRITISH HONDURAS (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No.	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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	38	0.4	1	37	-

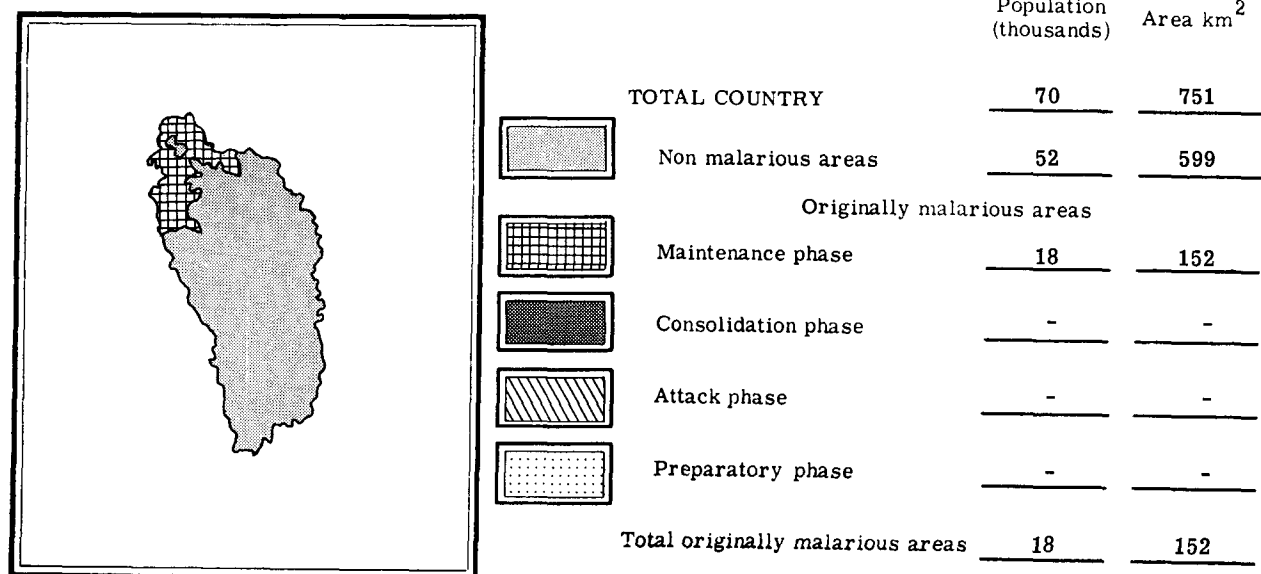
CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. faldi- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1962	(b)	100	6 661	16.0	18	10	7	1	-	-	-	-	-	18	-
1963	1-4	100	13 085	13.1	17	17	-	-	-	-	-	-	-	17	-
1964	1-4	104	11 826	11.4	35	32	2	1	-	-	-	-	-	35	-
1965	1-4	105	10 787	10.3	206	200	-	4	-	-	-	2	188	18	-
1966	1st	107	3 496	13.1	40	40	-	-	-	-	-	-	26	14	-
	2nd		2 968	11.1	95	94	-	1	-	-	-	-	22	73	-
	3rd		2 599	9.7	104	104	-	-	-	-	-	-	20	84	-
	4th		4 857	18.2	313	313	-	-	-	-	-	-	192	121	-
1967	1st	46	520	4.5	3	-	-	-	3	-	-	-	-	3	-
	2nd		471	4.1	4	-	-	2	2	-	-	-	1	3	-
	3rd		272	2.4	2	1	-	-	-	-	-	1 c)	2	-	-
	4th		551	4.8	8	7	-	-	1	-	-	-	7	1	-
1968	1st	48	375	3.1	-	-	-	-	-	-	-	-	-	-	-
	2nd		365	3.0	-	-	-	-	-	-	-	-	-	-	-
	3rd		422	3.5	-	-	-	-	-	-	-	-	-	-	-
	4th		419	3.5	-	-	-	-	-	-	-	-	-	-	-

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

DOMINICA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	-	-
Evaluation operations	(1)	5(1)	5(2)
Administrative and other	-	-	-
Transport	-	-	-
Total	(1)	5(1)	5(2)

TRANSPORT FACILITIES

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

(Part-time personnel in parentheses)

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1959 ^{a)}	2 801	46	1.6	46	-	-
1960	6 151	6	0.1	6	-	-
1961	10 113	3	0.0	1	-	2
1962	13 373	-	-	-	-	-

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1963	1-4	14	16775	119.8	-	-	-	-	-	-	-	-	-	-	-
1964	1-4	14	16154	115.4	-	-	-	-	-	-	-	-	-	-	-
1965	1-4	15	9894	66.0	-	-	-	-	-	-	-	-	-	-	-

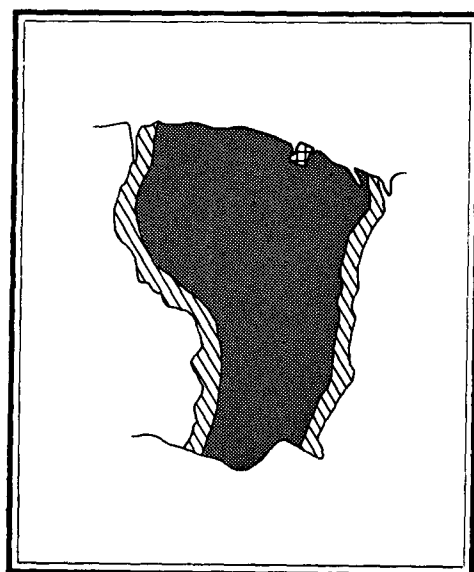
MAINTENANCE PHASE AREAS

1966	1st	17	1 244	29.3	-	-	-	-	-	-	-	-	-	-	-
	2nd		1 939	45.6	-	-	-	-	-	-	-	-	-	-	-
	3rd		1 084	25.5	-	-	-	-	-	-	-	-	-	-	-
	4th		2 367	55.7	-	-	-	-	-	-	-	-	-	-	-
1967	1st	18	1 157	25.7	-	-	-	-	-	-	-	-	-	-	-
	2nd		1 430	31.8	-	-	-	-	-	-	-	-	-	-	-
	3rd		...	-	-	-	-	-	-	-	-	-	-	-	-
	4th		984	22.0	-	-	-	-	-	-	-	-	-	-	-
1968	1st	18	2 496	55.5	-	-	-	-	-	-	-	-	-	-	-
	2nd		1 217	27.0	-	-	-	-	-	-	-	-	-	-	-
	3rd		817	18.2	-	-	-	-	-	-	-	-	-	-	-
	4th		667	14.8	-	-	-	-	-	-	-	-	-	-	-

a) June-December.

FRENCH GUIANA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	41	86 000
Non malarious areas	-	54 000
Originally malarious areas		
Maintenance phase	25	200
Consolidation phase	13	23 400
Attack phase	3	8 400
Preparatory phase	-	-
Total originally malarious areas	41	32 000

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	71	71
Evaluation operations	2	4	6
Administrative and other	-	3	3
Transport	11	-	11
Total	17	74	91

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	10	10
Two-wheel vehicles	-	-	4	4
Boats	-	-	6	6
Animals	-	-	-	-
Other	-	-	-	-
Total	-	-	20	20

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	...	...	...	...

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

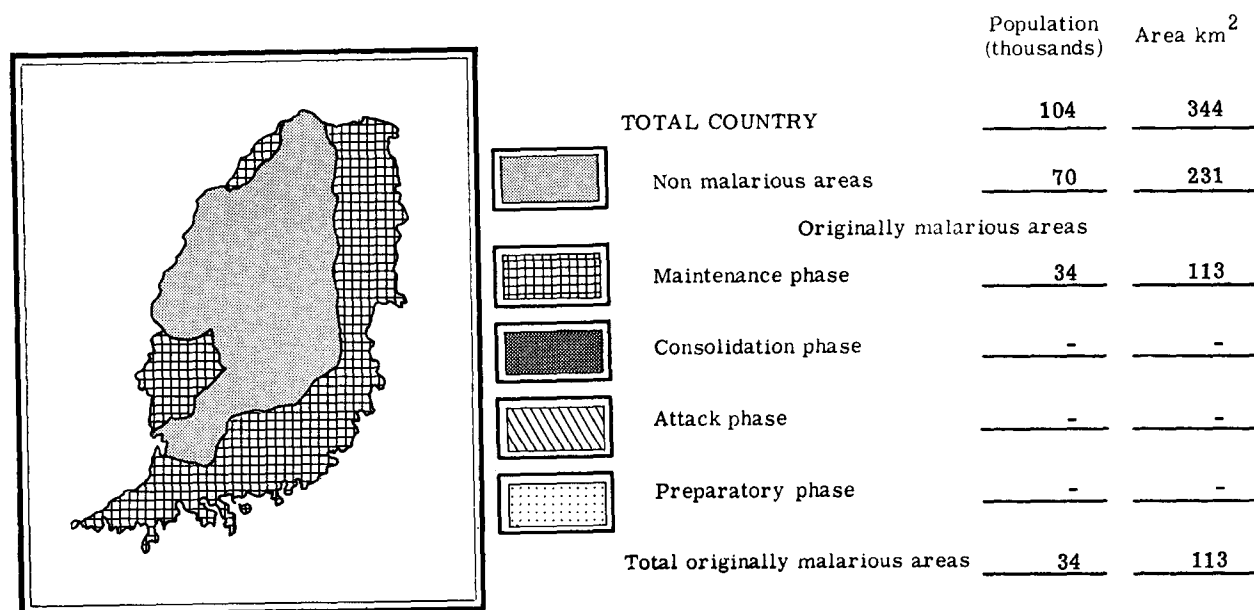
FRENCH GUIANA (Cont.)

EPIDEMIOLOGICAL EVALUATION OPERATIONS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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

GRENADA AND CARRIACOU

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



(Island of Carriacou in Maintenance phase,
not shown in the Map).

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	-	-
Evaluation operations	-	24(1)	24(1)
Administrative and other	-	-	-
Transport	-	-	-
Total	-	24(1)	24(1)

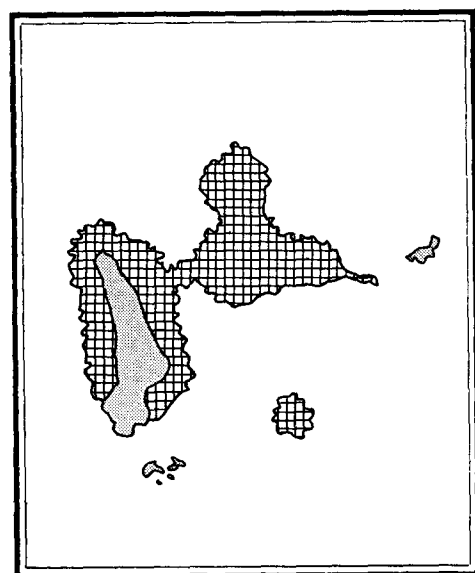
TRANSPORT FACILITIES

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

[illegible]

GUADELOUPE

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



	Population (thousands)	Area km ²
TOTAL COUNTRY	330	1 779
Non malarious areas	41	643
Originally malarious areas		
Maintenance phase	289	1 136
Consolidation phase	-	-
Attack phase	-	-
Preparatory phase	-	-
Total originally malarious areas	289	1 136

PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	-	-
Evaluation operations	1(1)	6(3)	7(4)
Administrative and other	-	-	-
Transport	-	-	-
Total	1(1)	6(3)	7(4)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	2(1)	-	2(1)
Two-wheel vehicles	-	-	-	-
Boats	-	-	-	-
Animals	-	-	-	-
Other	-	-	-	-
Total	-	2(1)	-	2(1)

Figures in parentheses are to be considered as part-time.

EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total No	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		Number	Percentage			
1958	1 150	3	0.26	-	-	3
1959	3 903	-	0	-	-	-
1960 ^{a)}	4 450	2	0.04	...	...	...

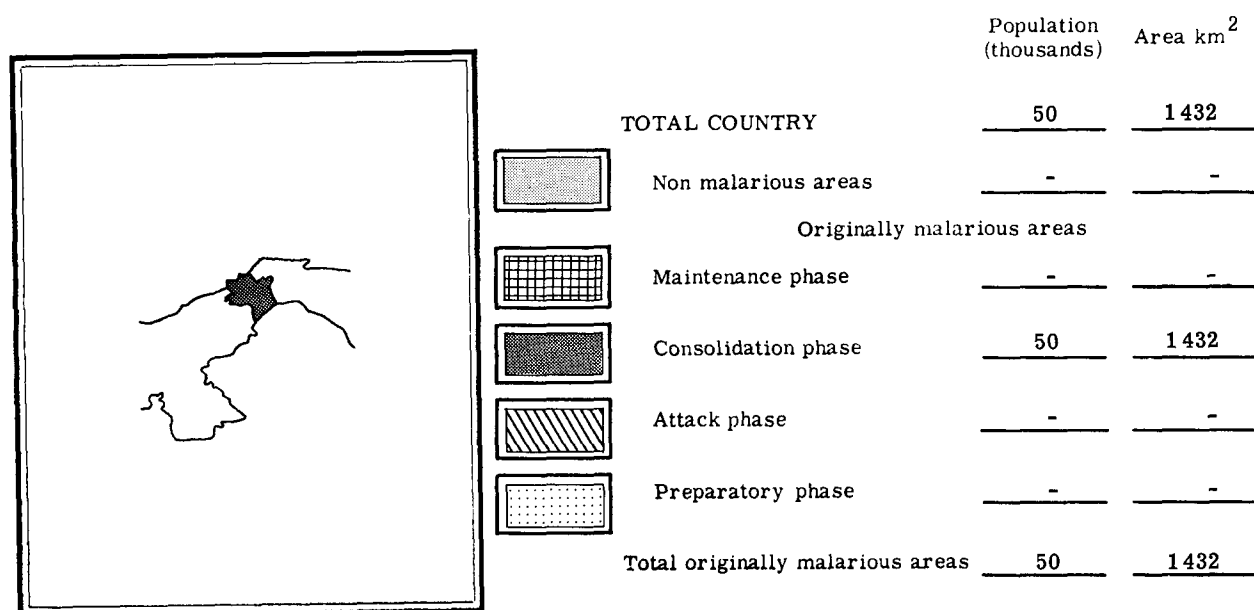
CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au-tochtho-nous	Relaps-ing	Imported		Induced	Intro-duced	Unclassi-fied	<u>P. falci-parum</u>	<u>P. vivax</u>	<u>P. malar-iae</u>
								from abroad	from areas within country						
1958	1-4	129	4 887	3.8	-	-	-	-	-	-	-	-	-	-	-
1959	1-4	133	3 691	4.8	-	-	-	-	-	-	-	-	-	-	-
1960	1-3	145	7 080	4.9	-	-	-	-	-	-	-	-	-	-	-
1961	1-4	186	11 857	6.4	-	-	-	-	-	-	-	-	-	-	-
1962	1-4	66	11 196	17.0	-	-	-	-	-	-	-	-	-	-	-
MAINTENANCE PHASE AREAS															
1961	1-4	58	2 407	4.1	-	-	-	-	-	-	-	-	-	-	-
1962	1-4	187	5 239	2.8	-	-	-	-	-	-	-	-	-	-	-
1963	1-3	260	17 170	8.8	1	-	-	1	-	-	-	-	-	-	-
1964	1-4	298 ^{b)}	21 831 ^{c)}	7.3	-	-	-	-	-	-	-	-	-	-	-
1965	1-4	300 ^{b)}	33 512 ^{c)}	11.2	-	-	-	-	-	-	-	-	-	-	-
1966	1-4	312 ^{b)}	32 022 ^{c)}	10.3	-	-	-	-	-	-	-	-	-	-	-
1967	1-4	287	17 882 ^{c)}	6.2	-	-	-	-	-	-	-	-	-	-	-
1968	1-4	289	14 018 ^{c)}	4.9	-	-	-	-	-	-	-	-	-	-	-

a) January-September. b) Includes population of areas originally non-malarious. c) Includes slides taken in non-malarious areas.

PANAMA CANAL ZONE

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	(23)	(23)
Evaluation operations	-	(17)	(17)
Administrative and other	-	(2)	(2)
Transport	-	(4)	(4)
Total	-	(46)	(46)

TRANSPORT FACILITIES

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

Figures in parentheses are to be considered as part-time.

PANAMA CANAL ZONE (Cont.)

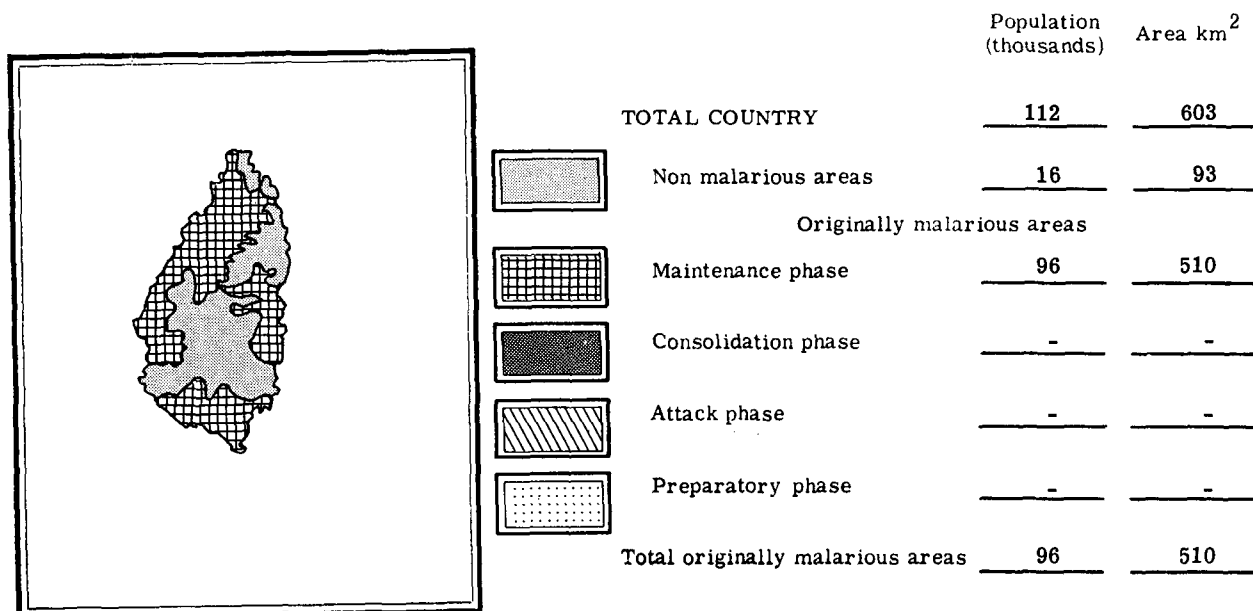
EPIDEMIOLOGICAL EVALUATION OPERATIONS, CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au-tochtho-nous	Relaps-ing	Imported		Induced	Intro-duced	Unclassi-fied	<u>P. falci-parum</u>	<u>P. vivax</u>	<u>P. malar-iae</u>
								from abroad	from areas within country						
1960	1-4	41	2 656	6.5	27	27	-	-	-	-	-	-	3	24	-
1961	1-4	41	5 984	14.6	25	25	-	-	-	-	-	-	2	23	-
1962	1-4	44	677	1.5	18	18	-	-	-	-	-	-	-	18	-
1963	1-4	47	21 008	44.7	22	-	1	16	-	-	-	5	2	20	-
1964	1-4	50	26 228	52.5	21	7	3	1	10	-	-	-	-	21	-
1965	1-4	50	24 024	48.0	38	1	7	29	-	-	1	-	6	32	-
1966	1-4a	50	23 434	51.1	71	26	4	41	-	-	-	-	1	70	-
1967	1-4	50	29 762	60.0	111	87	8	16	-	-	-	-	7	104	-
1968	1-4	50	22 367	44.7	89	70	8	10	-	-	-	-	5	84	-

(a) January-November.

ST. LUCIA

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	-	-	-
Evaluation operations	-	3(1)	3(1)
Administrative and other	-	-	-
Transport	-	-	-
Total	-	3(1)	3(1)

TRANSPORT FACILITIES

Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	1	-	1
Two-wheel vehicles	-	1	-	1
Boats	-	-	-	-
Animals	-	-	-	-
Other	-	-	-	-
Total	-	2	-	2

(Part-time personnel in parentheses)

ST. LUCIA (Cont.),

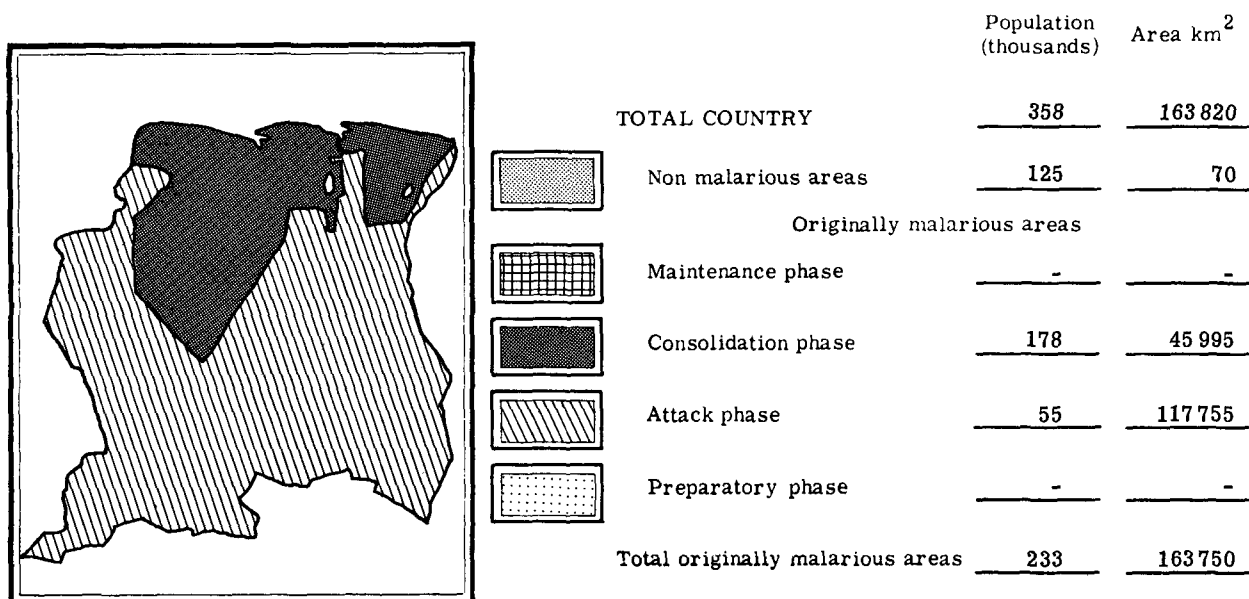
EPIDEMIOLOGICAL EVALUATION OPERATIONS, MAINTENANCE PHASE AREAS

Date		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		
Year	Quarter					Autochthonous	Relapsing	Imported		Induced	Introduced	Unclassified	<u>P. falciparum</u>	<u>P. vivax</u>	<u>P. malariae</u>
								from abroad	from areas within country						
1962	4th	82	5 059	24.7	-	-	-	-	-	-	-	-	-	-	-
1963	1-4	82	15 136	18.5	7	2	2	-	-	-	-	3 ^a)	-	-	7
1964	1-4	84	13 368	15.9	4	-	4	-	-	-	-	-	-	-	4
1965	1-4	87	11 201	12.9	-	-	-	-	-	-	-	-	-	-	-
1966	1-4	93	3 452	3.7	-	-	-	-	-	-	-	-	-	-	-
1967	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1968	1-4	96	6 771	7.1	-	-	-	-	-	-	-	-	-	-	-

a) Uncertain origin.

SURINAM

STATUS OF MALARIA PROGRAM AT DECEMBER 1968



PERSONNEL

Activity	Professional	Non professional	Total
Spraying operations	1	45	46
Evaluation operations	(1)	42	42(1)
Administrative and other	1	27	28
Transport	1	51	52
Total	4(1)	164	168(1)

TRANSPORT FACILITIES

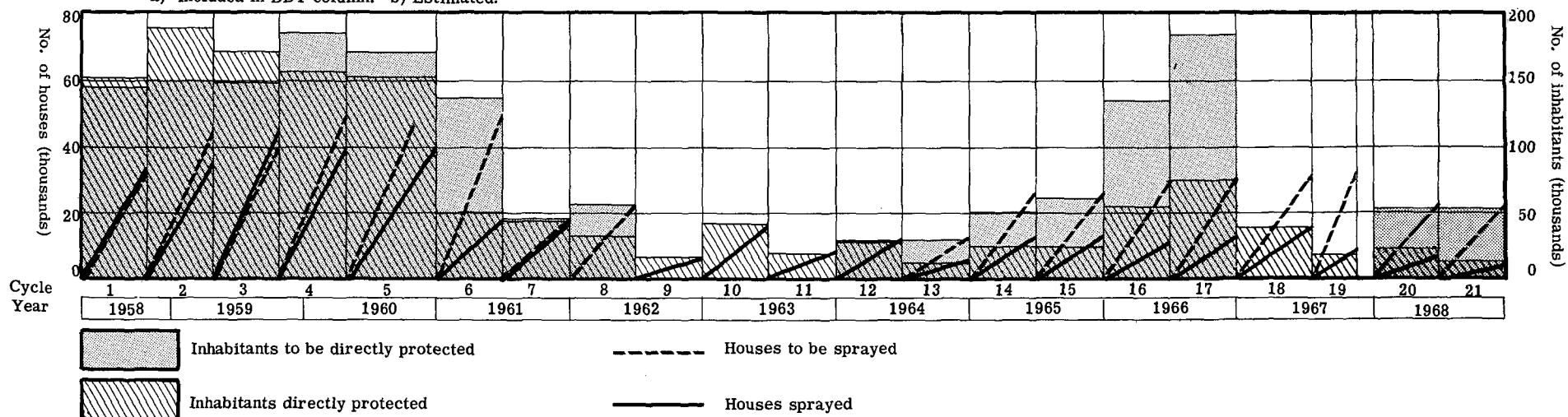
Type	Spraying Operations	Evaluation Operations	Mixed or other operations	Total
Four-wheel vehicles	-	-	9	9
Two-wheel vehicles	-	-	22	22
Boats	-	-	29	29
Animals	-	-	-	-
Other	-	-	-	-
Total	-	-	60	60

(Part-time personnel in parentheses)

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	-	-	-	... 29 300	19 164 27 893	-	-	...
7th	Jul. 64-Jun. 65	13th 14th	12 824 25 648	682 1 813	1st 2nd 3rd	(a) (a) (a)	6 605 4 708 10 969	29 300 28 693 52 873	27 893 12 060 26 350	175 217 191	61 62 66	6.5 6.3 7.8
8th	Jul. 65-Jun. 66	15th 16th	25 648 29 486	11 550 1 488	4th 5th 6th	(a) (a) (a)	(a) 10 394 8 975	58 279 55 319 73 953	25 260 22 292 29 625	... 164 161	... 84 76	... 6.4 6.3
9th	Jul. 66-Jun. 67	17th 18th	31 546 31 950	3 662 3 320	7th	(a)	11 754	...	37 096	179	77	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-Dec. 68	21st	22 406	1 653	10th	(a)	4 033	54 981	9 719	169	77	5.1

a) Included in DDT column. b) Estimated.



EPIDEMIOLOGICAL EVALUATION OPERATIONS, ATTACK PHASE AREAS

Year	Slides examined			Species found		
	Total	Positive		<u>P. falci-</u> <u>parum</u>	<u>P. vivax</u>	<u>P. malariae</u>
		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	7.0	1 517	1	12

CONSOLIDATION PHASE AREAS

Date		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		
Year	Quarter					Au- tochtho- nous	Relaps- ing	Imported		Induced	Intro- duced	Unclassi- fied	<u>P. falci- parum</u>	<u>P. vivax</u>	<u>P. malar- iae</u>
								from abroad	from areas within country						
1961	1-4	225	14 894	6.6	26	-	-	-	26	-	-	-	23	-	3
1962	1-4	240	19 025	7.9	22	-	1	-	21	-	-	-	17	-	5
1963	1-4	240	38 861	16.2	33	-	-	-	33	-	-	-	28	3	2
1964	1-4	253	53 369	21.1	38	-	-	-	38	-	-	-	35	1	2
1965	1-4	262	20 366	7.8	74	-	-	-	74	-	-	-	69	-	5
1966	1-4	277	7 411	2.7	51	-	-	-	49	-	-	2	47	3	1
1967	1-4	281	8 488	3.0	25	1	-	-	24	-	-	-	25	-	-
1968	1-4	303	13 055	4.3	25	-	-	4	17	-	-	4	24	1	-

(a) May-December. (b) Includes the population of the city of Paramaribo, originally non-malarious area. (c) Includes slides taken and positives found in Paramaribo, originally non-malarious area.

II. SPECIAL TECHNICAL PROBLEMS

A. General status

Previous reports showed with some detail the technical problems which are hampering the progress towards eradication. The entomological problems are the physiological resistance of the vector to the common insecticides, the insecticide avoidance, and the resting habits of the vector outdoors after biting in or outdoors. These problems are known to exist in some areas of Mexico, Central America, Colombia, and Venezuela.

The known parasitological problems are related to the chloroquine-resistance of some strains of P. falciparum found in some areas of Brazil and Colombia and occasionally found in the neighbouring areas of Venezuela and Guyana.

The anthropological problems are due to factors related to human ecology. There are human groups with very limited contact with civilization, which cannot be protected with insecticide spraying due to difficulties in accessibility, and the types of dwelling or shelters, in a jungle environment which does not allow to contact them with the necessary regularity for the application of other measures. In other instances, migrations are a danger for areas in an advanced stage of the attack phase or in the consolidation or maintenance phases, when migratory movements are originated in areas with malaria transmission from which infected persons may arrive and reestablish transmission in clean areas. The colonization of new areas where the vector is present usually results in an increase of malaria incidence, due to the meeting of carriers coming from malarious areas and unimmune persons coming from non-malarious areas, transmission being favoured by high rates of building during inter-spraying periods of new dwelling which are, in a high proportion, incompletely built.

Present information indicates that about 11% of the population of the originally malarious areas in the 20 active programs, lives in areas with technical problems. Efforts are being made to determine this, with the highest possible accuracy.

For the first time in several years, an additional area in which the vector is resistant to DDT was discovered during 1968. The area is apparently small, although determination of its extent is still in process; it is located in the area of Danli, Dept. of Paraiso, Honduras, and is thought to have developed as a result of agricultural spraying with insecticides following the introduction into the area of cotton cultivation. A malaria outbreak in the area, which had been in attack phase under DDT spraying, brought the newly developed resistance to light. The outbreak is being controlled with collective treatment of the population with anti-malarial drugs.

No other changes have been noted in the technical problems confronting eradication programs in the Americas.

B. Activities for Solving Technical Problems

1. Use of alternative insecticides

The use of malathion continues in areas of strong vector resistance to dieldrin and DDT in Nicaragua, supplemented in centers of high endemicity by collective treatment of the population. Response to the combination of malathion and drugs was favorable during 1968.

2. Larviciding

In Nicaragua larviciding with fenthion and Paris green continued to be applied, but their results were considered clearly satisfactory in only two of the eight areas so treated. A complete revision of the selection of potential breeding places for larviciding and the methods for evaluation of the effectiveness of the measure will be carried out in 1969.

3. Additional cycle of DDT

Restricted use of additional DDT - spraying between regular and semi-annual cycles or programmed quarterly cycles, was continued in some programs in areas with persistent transmission due to frequent modification of sprayable surfaces in houses.

4. Mass drug distribution

This attack measure continued to be a basic attack measure in the Central American programs (except for British Honduras) in the effort to interrupt transmission in the coastal areas when vectors are DDT-resistant, and over a million persons were being included in drug programs at the end of the year (See Table 17). Although new drug programs initiated during the year in Costa Rica were very successful, the great majority of the drug areas in the other four countries showed levels of coverage of the population well below any acceptable figure. Examples are shown in Figures 2, 3, and 4. The failure to treat an adequate percentage of the total populations of the areas results mainly from reluctance of the inhabitants to accept the treatment, which shows itself in high refusal rates and high absence rates. Measures to improve the situation through improvement of the operating activities are being made in all programs, while at the same time, investigation of other methods of chemotherapeutic protection which will be more acceptable to the population continues (See Chapter III).

In Haiti coverage began to become a problem as the excellent levels attained earlier appear to have fallen in 1968, especially in one area near the Capital. During the second half of 1968, chemotherapy was programmed and administered preventively rather than in response to the appearance of foci. Drugs were combined with DDT-spraying in areas with about 900,000 inhabitants. The results indicated a reduction in the number of malaria cases.

Colombia continued to use the combination of chloroquine-primaquine-pyrimethamine given in three days presumptively to all fewer cases in addition to semi-annual spraying cycles in some areas with difficulties in the interruption of transmission. Peru also used this treatment, administered to the entire population, in selected localities along some riverbanks where the presence of indigenous population with precarious housing in areas of such difficult access, that case-detection activities cannot be carried out adequately, has required additional attack measures. The collective treatment is repeated monthly for three consecutive months (occasionally for four months). In the areas with satisfactory information, response of the incidence rate has been most acceptable.

In Brazil, an experiment with collective treatment with chloroquine-primaquine administered weekly for twelve weeks was carried out along the Mucajai river in Roraima, following the same pattern as the successful previous trial made in Rio Tinto in Paraiba. The Amazon area in Roraima was found to have a very fluid population (turnover of 14.5% per week) and to be strongly influenced by neighbouring high-incidence areas. The percentage of examined blood-smears found positive for malaria at the start of the program was 34%, and this was reduced by the end of the twelve weeks to 13%, a level which was not considered satisfactory. A survey carried out four weeks after termination of the drug program indicated that positivity had already climbed back up to 22%. The costs of drug administration in the Mucajai River area (with dispersed houses along 20 km. of river) were very much higher than they had been in the Paraiba trial.

Medicated salt continued in use as the preferred vehicle for collective treatment of the population in the Guyanas, being used extensively in Surinam and Guyana and along the Surinam border in French Guiana. In Surinam, acceptance, which has been a problem, improved considerably. An area of low acceptance still remains along the uppermost reaches of the Surinam River, where efforts to expand the use of the medicated salt will continue to be made. Incidence dropped satisfactorily in those districts in which acceptance had improved. It is planned to look into the possibility of providing salt to the Amerindians of the remote interior during 1969.

5. Intensified case-detection and radical-cure treatment

This measure was adopted as the attack method in an area in Nicaragua; incidence was reduced during 1968 from its 1967 levels, but the reduction was less than that of any of the other four combinations of attack measures in use in other areas of the program. Evaluation of this attack measure showed, however, that its application left much to be desired, the coverage of case-detection activities being below optimum, the time between taking an examination of the blood-smear being long, the blood-smears often poorly made and stained, and the percentage of confirmed cases given complete radical-cure treatment too low in some of the localities. Localities with better performance in these respects, showed a reasonable sharp decline in the number of cases found, while of those with poor performance some even showed increases. Evaluation of the effectiveness of the measure if thoroughly carried out could not be made, and improvement of operations if feasible within cost limitations was recommended, with addition of other attack measures, should cost figures show these to be desirable.

Table 17
MASS DRUG PROGRAMS IN THE AMERICAS, 31 DEC. 1968

Country and name of area	Population	Area km ²	Drug used	Drug cycle	Number of cycles 31 Dec. 1968	Population treated (percentage)	Slides examined	Positive cases
<u>Bolivia</u>								
Pilcomayo	2 390	6 694	Chloroquine + Primaquine	14 days	12	77.0	1 856	8
<u>Costa Rica</u>								
Central Pacific	30 109	986	Chloroquine + Primaquine	14 days	16	96.8	6 177	2
<u>El Salvador</u>								
Zone I	74 510	1 150	Chloroquine + Primaquine	14 days	18	77.0	12 155 a)	94
Zone II	104 013	1 175	"	"	18	55.0	18 568 a)	84
Zone III	86 650	1 250	"	"	17	72.0	19 704 a)	75
Zone IV	89 920	930	"	"	17	43.0	22 974 a)	116
Zone V	89 304	300	"	"	17	45.0	17 354 a)	77
Total	444 397							
<u>Guatemala</u>								
South Pacific Cost	200 779	5 500	Chloroquine + Primaquine	14 days	19	49.2	14 070	221
North: Alta Verapaz and Izabal	39 829	1 500	"	"	17	82.8	5 003	469
Total	240 608							
<u>Haiti</u>	900 000	4 900	Chloroquine + Pyrimetha- mine	3 weeks	Various according to area	...	...	-

a) Active case detection only.

Table 17 (Cont.)

MASS DRUG PROGRAMS IN THE AMERICAS, 31 DEC. 1968

Country and name of area	Population	Area km ²	Drug used	Drug cycle	Number of cycles 31 Dec. 1968	Population treated (percentage)	Slides examined	Positive cases
<u>Honduras</u>								
District I	17 194	364	Chloroquine +Primaquine	14 days	92	51.0	5 138	576
District II	23 582	377	"	"	42	35.0	2 140	27
District III	32 254	584	"	"	38	44.0	3 442	122
District IV	29 795	729	"	"	33	46.0	7 050	15
District V	24 409	1 013	"	"	33	46.0	4 576	88
District VI	23 065	1 695	"	"	5	88.0	1 789	135
Total	150 299							
<u>Nicaragua</u>								
Area B	130 886	7 317	Chloroquine +Primaquine	14 days	31	66.63	19 378	67
Area D	69 238	3 956	"	"	35	64.23	5 316	48
Area E	29 726	1 140	"	"	31	65.42	2 238	35
Total	229 850							
<u>Peru</u>								
Ene	3 274	5 500	Chloroquine +Primaquine +Pyrimetha- mine	45 days	8	87.4	5 055	100
Satipo	2 454	1 000	"	30 days	6	92.1	3 321	22
Yurimaguas	14 759	600	"	"	6	59.0	4 391	75
Canchaque	731	30	"	"	3	44.7	138	3
Total	21 218							

FIGURE 2

COLLECTIVE TREATMENT PROGRAMS WITH ANTIMALARIA DRUGS

COSTA RICA: Pacífico Centro, Sur
Population: 30,109

*EL SALVADOR: Zone I. Area "A"
Population: 45,000

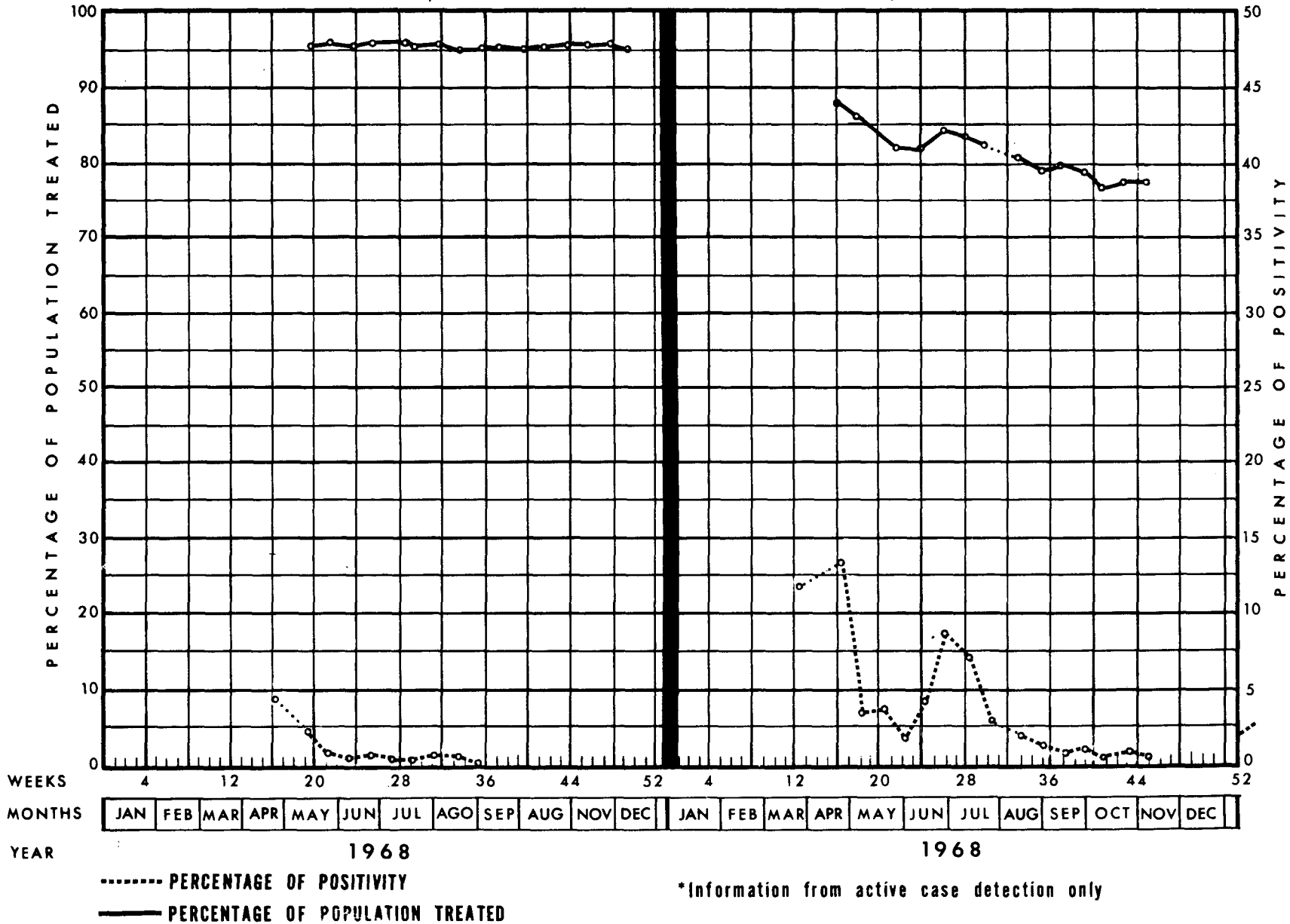


FIGURE 3

COLLECTIVE TREATMENT PROGRAMS WITH ANTIMALARIA DRUGS

HONDURAS: Distric 1. Municipality: Marcovia: Dpt. Choluteca

Population: 15,528

HONDURAS: Valle Jamastran. Municipality: Danli, Dpt. El Paraiso

Population: 23,284

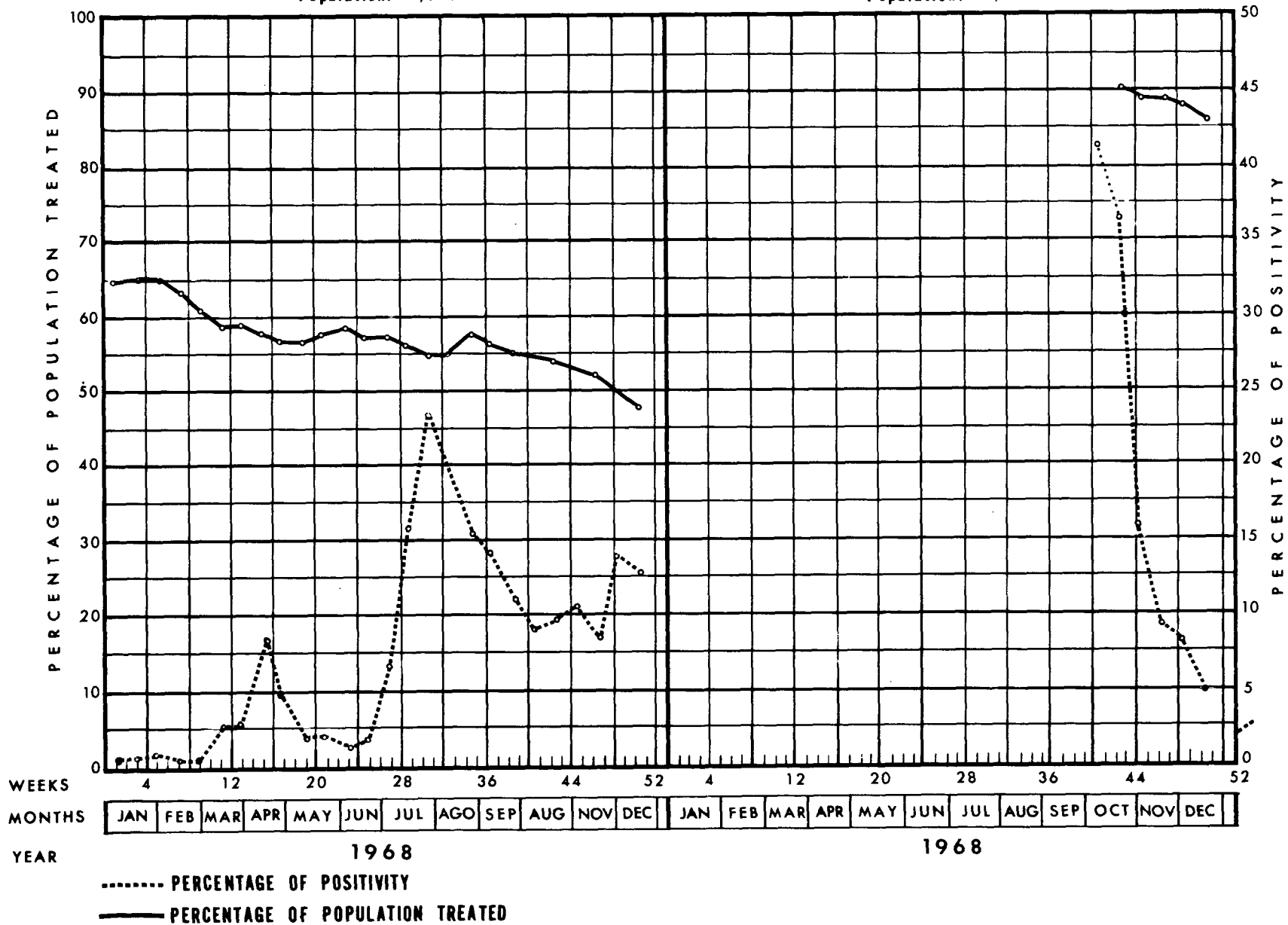
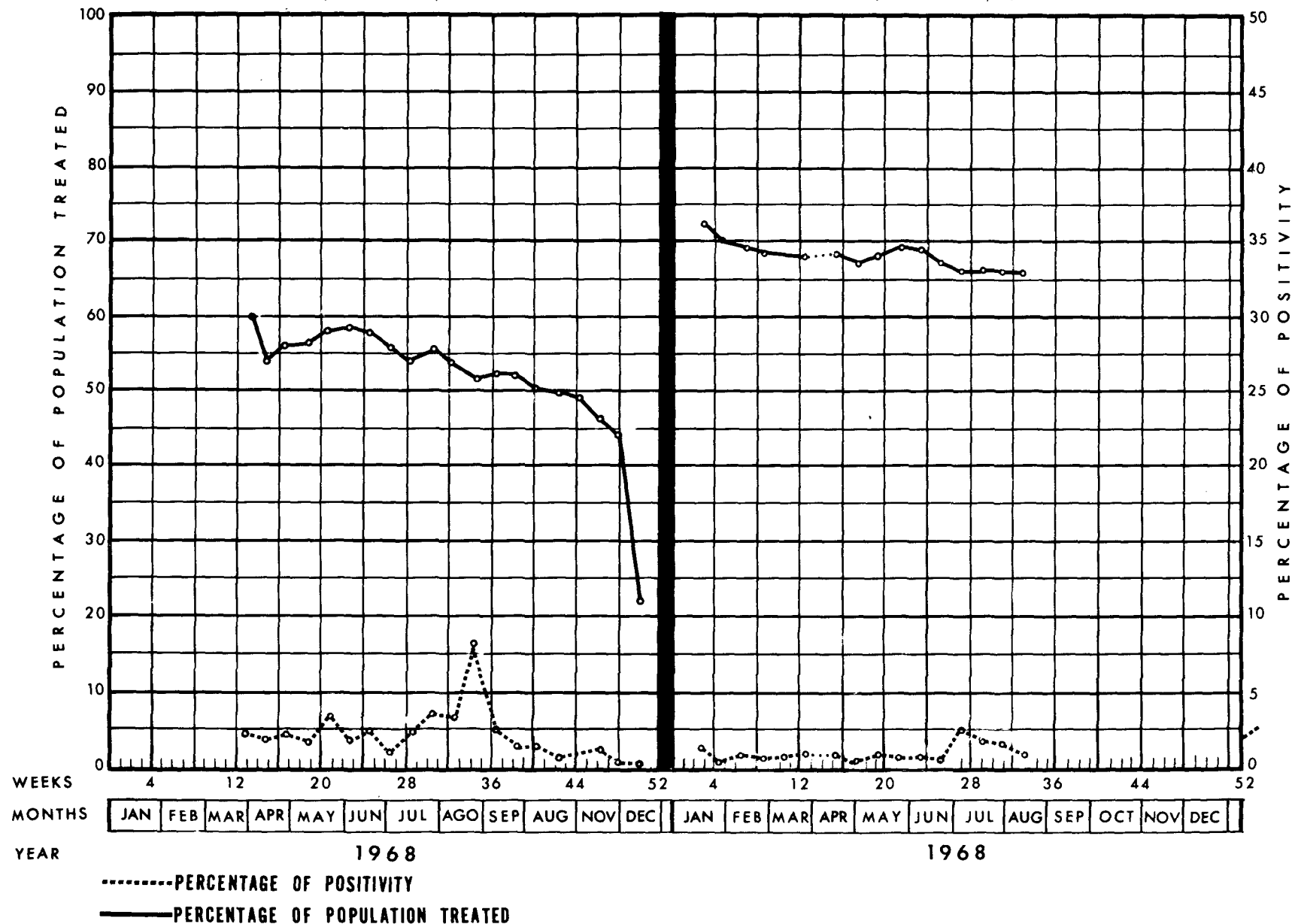


FIGURE 4 COLLECTIVE TREATMENT PROGRAMS WITH ANTIMALARIA DRUGS

GUATEMALA: Sector No. 4, Tiquisate. Dpt. Esquintla
Population: 24,400

NICARAGUA: Leon. Districts 5-9
Population: 83,702



III. RESEARCH

Orientation toward problems urgently requiring solution for current application in eradication campaigns continues to govern the research program of the Organization. Fields of investigation include new applications of anti-malarial drugs, new insecticides, new methodology and economic effects of malaria.

A. Evaluation of New Insecticide

In AMRO-0216 in El Salvador, OMS-29 was tested in two new houses at 2 gm/m² using bioassay and release studies with wall-trap captures. Later, 61 houses were sprayed in three localities and susceptibility tests made with wild-caught A. albimanus, which gave evidence of susceptibility. This work was not pursued further as it was decided to concentrate upon evaluation of OMS-33.

The spraying of OMS-33 previously done under AMRO-0209 was continued during 1968 in order that the effectiveness of the insecticide in interrupting transmission could be studied. The cycles were not, however, carried out precisely on the planned dates, but rather in January, June, September 1968, and January 1969. Coverage was excellent, ranging between 90 and 100% of houses with an average of 96 per cent.

Vector density measurements were continued in the OMS-33 area in comparison areas in Canton Sirama, La Unión, under DDT plus collective treatment. Results indicated that the numbers captured in human bait captures were more closely related to rainfall and climatic conditions than to the spraying cycle. Early morning searches for live and dead anopheles show the effect of OMS-33 cycles; in the DDT area no dead mosquitoes were found (it is an area of DDT-resistance), and early morning densities of live mosquitoes were fairly high, dropping sharply in August and September after DDT-spraying in August and the initiation in September of aerial spraying of cotton fields nearby.

Active case-detection was carried out on 3-week cycles, and all cases found were given prompt radical cure, except for eight cases which could not be found. The occurrence of cases was analyzed by the time of occurrence in the cycle and by locality. Positivity was found to have fallen sharply in 1968. (See Figure No. 5).

It was noted that OMS-33 had the great advantage of ridding the sprayed houses of numerous other common household pests. It was therefore readily accepted by householders and may, moreover, be of value in combatting other vector-borne diseases in addition to malaria.

B. Investigations in Chemotherapy

1. Long-action malaria drugs

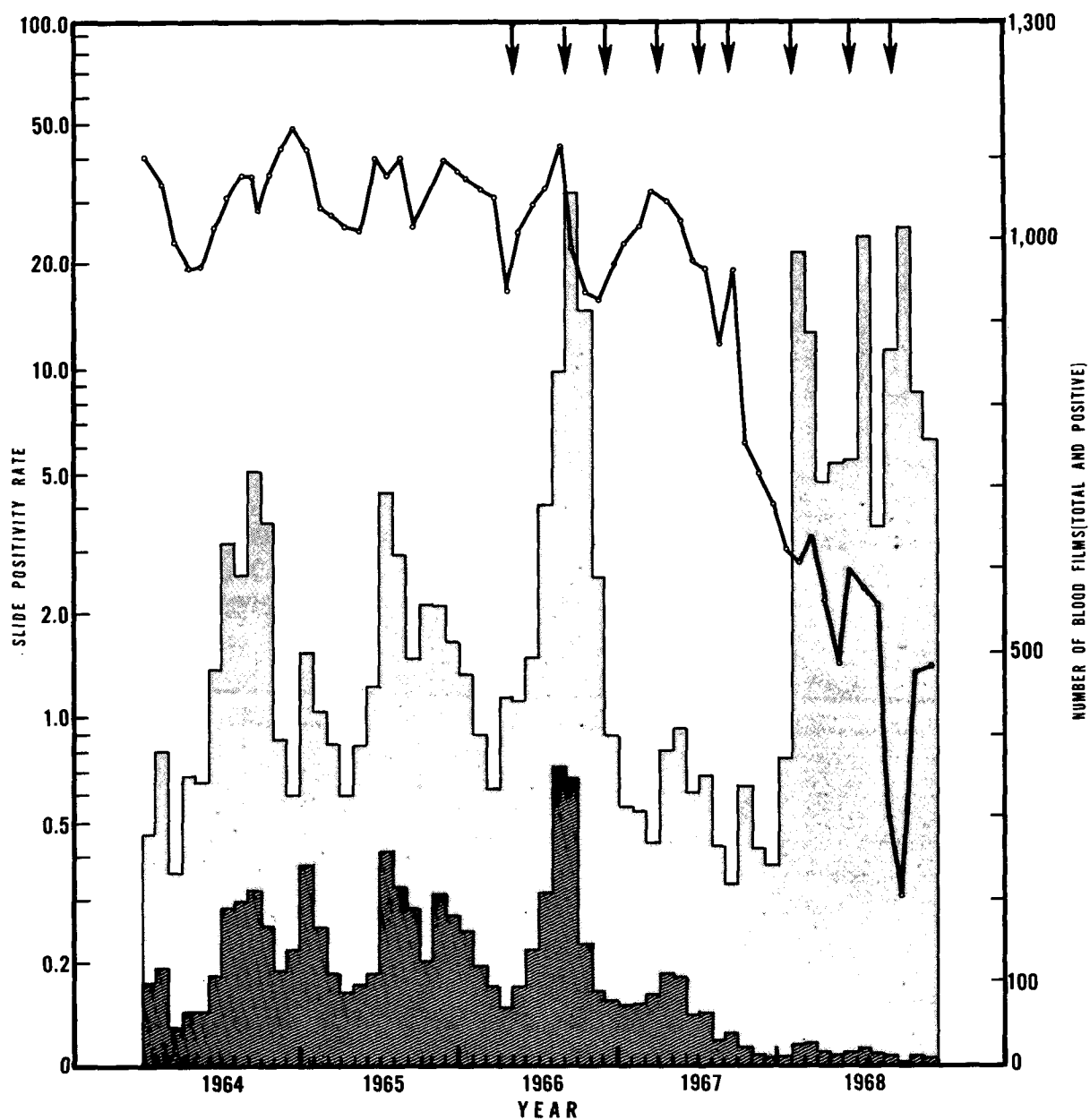
The field trial in Guatemala of the injectable long-acting drug, cycloguanil embonate, was continued, and the third and fourth cycles of injections were administered. Coverage fell slightly from around 80% in the second cycle to 77% in the third. Results of smears taken at the time of the third cycle are available, showing in District I, where smears were collected by mass blood survey, 14 cases in 2,977 smears examined, of which 11 were in persons who had received no previous injection and 3 persons who had received at least one previous injection; in District II, where smears were collected by fever-case survey, 54 cases were found in 511 smears, 48 being in persons not previously injected and 6 in those who had received at least one injection. More attention to evaluation of the effectiveness of the treatment is being given in current operations, the original questions concerning feasibility, acceptability, and cost having been reasonably well investigated in the early cycles. Guidance in this respect is being given under AMRO-0216 and by the Research Officer, in the Malaria Eradication Department.

2. Liquid preparations

A field trial of a liquid preparation of amodiaquine and primaquine was made in a limited area in Marcovia, Department of Choluteca, Honduras, but the analysis of the results has not been completed as yet.

FIGURE 5

MALARIA TRENDS IN THE OMS-33 SPRAYED AREA IN EL SALVADOR, BEFORE AND AFTER SPRAYING(1964-1968)



- Slide positivity rate
- Total number of blood films taken
- Number of positive blood films
- ↓ Date of starting each spray round

3. Use of primaquine-pyrimethamine in collective treatment

The field trial projected for standard operational use of primaquine and pyrimethamine as a collective treatment in two-week cycles was postponed because of delays in acquisition of the drugs.

4. Response of *P. falciparum* to chloroquine and other drugs

Investigations of the response of *P. falciparum* infections to chloroquine and to pyrimethamine-sulphorthomidine continued in Brazil. Five different treatments have been administered:

- a) Single dose of 10 mg/kg of chloroquine
- b) Standard dose of 25 mg/kg of chloroquine in 3 days
- c) Higher doses of chloroquine in 4 and 8 days
- d) Single dose of 0.85 mg/kg of pyrimethamine and 16 mg/kg of sulphorthomidine
- e) Dose of 0.85 mg/kg pyrimethamine and 24 mg/kg sulphorthomidine in 2 days

There have been up to the present four selected areas in which studies have been carried out, located as follows:

Area I : 6 localities in Conceição da Barra county in Espírito Santo

Area II : 5 localities in Três Lagoas county in Mato Grosso

Area III: 5 localities in Alenquer county in Pará (Amazon basin area)

Area IV: dispersed houses along 20 kilometers of the banks of the Mucajai river in Boa Vista and Caracarai counties in Roraima (extreme northern part of the Amazon basin).

Response to treatment (b) demonstrated susceptibility to chloroquine in only 15% of the cases treated. The remaining 85% were resistant, the majority with grade I resistance but 10% with grade II or grade III. There was no relationship between the proportion or grade of chloroquine resistance and the locality.

In Area I, of 43 cases given treatment with 40 mg/kg of chloroquine in four days, 41 cleared asexual parasites, but 15 of these had recrudescences from 15 to 30 days after the beginning of the treatment; two did not clear, one with grade II and the other with grade III resistance. In Area II, 27 cases received treatment with 50 mg/kg of chloroquine in eight days. All cleared asexual parasites but 18 experienced a recrudescence from 20 to 40 days after initiation of the treatment.

Treatment (d) was administered to 24 cases in Area III of which all cleared in three days and there were two recrudescences, and to 22 cases in Area IV, of which 21 cleared (20 on the third day and one on the fifth day) but four had recrudescences from 15 to 30 days after the beginning of treatment. The remaining case showed a moderate increase in parasitemia after treatment.

Treatment (e) was administered to 66 cases in Area I. Sixty four cleared on the third day and two on the fifth day. Two recrudescences occurred, 14 and 15 days after the initiation of treatment, both in pregnant women. This treatment was also given to 13 cases in Area II, of whom 12 cleared on the third day and one on the fourth day. No recrudescences occurred. In area III, 25 cases were treated and all cleared on the third day and remained clear.

5. Radical-cure treatments for *P. vivax*

Field activities of the trial of a three-day administration of chloroquine, primaquine, and pyrimethamine as a radical cure for *P. vivax*, which were being carried out in the valley of the Magdalena river in Colombia, were completed in mid-year after some 30 months of operation.

Final analysis of the results is in process; preliminary analysis showed no great differences in the numbers of persons found infected with *P. vivax* during the follow-up period between the experimental treatment and the classical 14-day treatment with chloroquine and primaquine.

Some field observations are also being made in Brazil concerning the course of *P. vivax* infections and their response to different treatments schemes. These were carried out in the coastal areas of Paraná and Santa Catarina where all cases of malaria are caused by this plasmodium. The objectives of the studies were: 1) to ascertain the immediate effect of different drugs and regimens on acute attacks; 2) to determine the most appropriate therapy for radical cure with the lowest relapse rate; 3) to observe the prophylactic effect of the drugs used, and 4) to work out therapeutic schedules which combine high effectiveness with feasibility for field application. Drugs included are sulphorthomidine, pyrimethamine, primaquine, and chloroquine. The design is based on grouping of three persons matched by age-group, of which two are positive for *P. vivax* and one negative at the initiation of the treatment. During 1968, the treatment under study were single doses of 10 mg/kg of chloroquine base, of 0.85 mg/kg of chloroquine + 24 mg/kg of sulphorthomidine, and of 5 mg/kg of chloroquine + 0.85 mg/kg of pyrimethamine + 0.85 mg/kg of primaquine + 10 mg/kg of sulphorthomidine. The negative controls were given 10 mg/kg of chloroquine followed by 0.25 mg/kg of primaquine daily for 14 days.

C. Investigation of the Economic Effects of Malaria

In an attempt to document the deleterious effect (which malariologists have long observed) that malaria incidence has upon productivity and economic development, an area in eastern Paraguay has been selected as the site of field activities aimed at continuous recording of all facets of the economic life of a selected sample of families. Recording was initiated in September, before the application of attack measures in the study localities, in order to obtain information of the situation which exists when malaria is still prevalent. It is planned to continue the measurements for an 18-month period to cover the first part of attack phase. It is hoped that the final six-month period will afford measurements of activities at a low level of incidence, to be compared with those of the equivalent season of 1968 already measured during an era of high incidence. Comparison areas, chosen for low initial incidence, were also included in the study. An attempt is also being made to include local industries, mainly lumbering and food processing.

IV. INTERNATIONAL COOPERATION

The team of international personnel who act to coordinate, guide, and assess the twenty-two national malaria eradication campaigns in the hemisphere, with consultants stationed - full-time in nineteen of these, is shown by category of staff in Table 18. Interzone and intercountry project personnel serve to reinforce country-assigned staff in technical aspects and to provide for close coordination among them, particularly in Central America. Also included are research projects being carried forward in the expectation of providing improved methods for all campaigns. Total personnel was somewhat reduced in 1969, despite the increased activity and growing personnel of national services.

Medical supplies furnished by PAHO in 1968 and in the 1958-1967 period are shown in Table 19. The bulk of them consists of anti-malarial drugs, which are provided by PAHO for administration to all persons with fever who present themselves for the taking of a blood-sample, and for use in the radical-cure treatment of confirmed cases. Drugs for medicated salt are supplied to programs using this measure. Occasionally, aspirin is provided to programs in advanced consolidation or maintenance in which anti-malarials do not attract fever cases to present themselves for blood examination.

In addition to drugs PAHO provided some vehicles, supplies and equipment, such as microscopes, syringes, entomological test equipment, and related items.

The contributions of PAHO/WHO, UNICEF, and US/AID during 1968 are given project-by-project in Table 20. The expenditures of both PAHO and WHO for malaria eradication in the Americas were in 1968 of 2.7 million being 94.1% of 1967 contribution. UNICEF contributed \$2.1 million (excluding freight charges), which was 93% of the 1967 level of their contributions. US/AID provided grant funds to seven programs and maintained intercountry research personnel for a total of \$2.0 million of 104% of 1967 expenditures. AID also aids malaria programs through the provision of long-term, low-interest loans, of which the details are shown in Table 15.

Table 18

PAHO/WHO FULL-TIME PROFESSIONAL AND TECHNICAL STAFF ASSIGNED TO COUNTRY, INTER COUNTRY,
AND INTER-ZONE MALARIA ERADICATION PROGRAMS IN THE AMERICAS, FROM 1966 TO MAY 1969*

Country or other political unit	Medical Officers				Sanitary Engineers				Sanitary Inspectors				Entomologists				Others			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Argentina	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	1	1	1	-	-	-	-	-	3	3	3	1	-	-	-	-	-	-	-	-
Brazil	4	5	5	4	2	1	1	1	3	4	5	5	-	2	2	1	4 ^{a)}	4 ^{a)}	2 ^{b)}	2 ^{b)}
Colombia	1	2	1	2	2	1	1	1	5	4	4	4	3	1	1	1	-	-	-	-
Costa Rica	1	1	1	1	-	-	-	-	3	3	2	2	-	-	-	-	-	-	-	-
Cuba	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Dominican Republic	1	1	1	1	-	-	-	-	2	2	1	1	-	-	-	-	1 ^{c)}	-	-	-
Ecuador	2	-	1	1	1	1	-	-	3	3	3	2	-	-	-	-	-	-	-	-
El Salvador	2	2	2	2	1	-	1	1	3	3	2	2	-	-	-	-	-	-	-	-
Guatemala	1	2	2	2	1	1	1	1	2	3	2	2	1	1	1	1	-	-	-	-
Guyana	-	-	-	-	-	-	-	-	1	2	2	2	-	-	-	-	1 ^{d)}	1 ^{d)}	1 ^{d)}	1 ^{d)}
Haiti	2	2	1	1	1	-	1	1	3	4	3	3	-	-	-	-	-	-	-	-
Honduras	1	1	1	1	-	1	-	-	2	1	2	2	-	-	-	-	-	-	-	-
Mexico	-	1	1	2	1	-	-	-	1	1	1	-	-	-	1	-	-	-	-	-
Nicaragua	1	2	2	2	1	1	1	1	2	2	4	3	-	-	-	-	-	-	-	-
Panama	1	1	1	1	1	1	1	1	3	3	3	2	1	1	-	-	-	-	-	-
Paraguay	-	-	1	1	-	1	1	1	1	2	2	2	-	-	-	-	-	-	-	-
Peru	1	1	1	1	1	1	1	1	3	3	3	3	-	-	-	-	-	-	-	-
British Honduras	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-
Surinam	1	1	1	-	-	-	-	-	3	3	3	3	-	-	-	-	1 ^{e)}	-	-	-
Inter-zone or inter- country projects	11	9	8	9	-	1	1	1	-	-	-	-	2	2	2	2	7 ^{f)}	8 ^{g)}	4 ^{h)}	4 ⁱ⁾
Total	32	33	32	32	12	10	10	10	46	47	46	40	7	7	7	5	14	13	7	7

- None.

a) Three administrative officers and one assistant engineer. b) Two administrative officers. c) Administrative officer. d) Laboratory technician. e) Health educator. f) One statistician, one administrative officer, two entomological assistants, one entomological aid, one operations analyst and one health educator. g) One statistician, two administrative officers, two entomological assistants, one entomological aide, one operations analyst and one health educator. h) Two statisticians and two administrative officers. i) One economist, one statistician and two administrative officers.

* As of 31 December of each year.

Table 19

DRUGS PROVIDED BY PAHO TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1958-1968

(In thousands of tablets)

Country or other political unit	Total 1958-1968							1968						
	Chloro- quine 150 mg.	Primaquine		Pyri- methamine 25 mg.	Combined drug ^{a)}	Aspirin		Chloro- quine 150 mg.	Primaquine		Pyri- methamine 25 mg.	Combined drug ^{a)}	Aspirin	
		15 mg.	5 mg.			0. 50 g.	0. 20 g.		15 mg.	5 mg.			0. 50 g.	0. 20 g.
Argentina	1 490	190	90	612	-	-	-	250	50	20	100	-	-	-
Bolivia	4 225	365	204	242	310	200	-	150	-	-	100	-	-	-
Brasil ^{b)}	92 470	1 513	775	204	1 600	-	-	13 300	-	-	-	625 ^{c)}	-	-
Colombia	22 695	2 355	830	3 824	4 148	100	20	1 300	20	-	1 500	2 000	-	-
Costa Rica	3 958	663	189	213	1 385	227	81	400	120	45	-	-	-	-
Cuba	3 950	38	69	80	-	-	-	500	-	-	-	-	-	-
Dominican Republic	9 394	38	197	782	-	10	10	500	-	-	-	-	-	-
Ecuador	8 616	589	230	275	-	-	-	1 200	150	20	80	-	-	-
El Salvador	12 255	484	660	128	2 070	-	-	1 000	-	-	-	-	-	-
Guatemala	11 719	931	119	77	8 049	-	-	1 500	50	-	-	-	-	-
Guyana ^{d)}	736	256	83	267	-	-	-	-	-	-	-	-	-	-
Haiti	6 120	82	-	1 480	30 608	-	-	-	-	-	-	5 000 ^{e)}	-	-
Honduras	10 939	1 202	922	88	1 290	-	-	1 000	-	-	-	-	-	-
Jamaica	879	18	-	288	50	-	-	-	-	-	-	-	-	-
Mexico	50 697	4 072	3 151	10 529	4 092	-	-	10 000	900	1 000	2 000	-	-	-
Nicaragua	9 303	847	736	6	6 933	-	-	2 000	200	-	-	-	-	-
Panama	3 480	554	228	146	-	-	-	200	50	-	-	-	-	-
Paraguay	7 585	128	59	48	-	-	-	1 000	20	15	-	-	-	-
Peru	20 756	1 009	378	867	1 040	433	40	-	-	-	-	20	-	-
Trinidad and Tobago ...	815	940	419	121	400	112	20	-	-	-	-	-	-	-
British Honduras	325	37	35	6	22	61	79	40	-	5	-	-	-	-
Dominica	90	1	1	45	-	40	-	-	-	-	-	-	-	-
French Guiana	100	1	-	-	32	-	-	-	-	-	-	-	-	-
Grenada	43	-	-	45	-	20	-	-	-	-	-	-	-	-
Panama Canal Zone ...	-	-	-	-	90	-	-	-	-	-	-	-	-	-
St. Lucia	68	1	-	70	-	36	-	-	-	-	-	-	-	-
Surinam ^{f)}	1 611	19	16	517	235	75	10	150	-	-	20	35	40	10
Total	284 319	16 333	9 391	20 960	62 354	1 314	260	34 490	1 560	1 105	3 800	7 680	40	10

a) Chloroquine 150 mg. / Primaquine 15 mg. adult size unless otherwise indicated. b) In addition there were provided 60. 000 fanasil tbs. c) Includes 155. 000 tbs. infant size, Chloroquine 75 mg. / Primaquine 7.5 mg. d) There were provided 2, 960 tbs. Chloroquine powder, 1, 750 lbs. Tricalcium phosphate, 18, 000 fanasil tbs. and 32 lbs. Pyrimethamine powder. e) Chloroquine 200 mg. / Pyrimethamine 16. 5 mg. f) In addition there were provided 863 lbs. Amodiaquine powder and 776 lbs. Tricalcium phosphate.

Estimated contributions for 1969 are also shown in Table 20. PAHO/WHO contributions are estimated at 115% of the 1968 level, UNICEF's at 122% of 1968 (before consideration of the re-inclusion of Mexico, should the eradication program be resumed), and US/AID's at 113% of its 1968 contribution.

The role played by international personnel and other contributions in the effectiveness of the massive national efforts cannot be measured by their dollar value. International contributions provide the equalizing factor essential to a cooperative hemisphere-wide program such as an eradication program of its nature must be: personnel are provided in greater measure where the need is greater, either because the technical or operational problems are more difficult, or because a program has not adequate specialized technical resources upon which to draw, contributions in goods are also to some degree a factor in preventing the development of too-wide gaps between the rates of progress of the various national malaria eradication campaigns. The true benefits of malaria eradication in the hemisphere will be substantially realized only when the point has been reached at which the risk of reinfection is very low, which requires that all American campaigns be brought along toward their goal with reasonably rapidity and no center of infection remain to put strong pressure on cleared areas. This goal and the subsidiary goal of maintaining even closer coordination between programs which neighbor each other or which have strong population exchanges are an important aim to be furthered through PAHO/WHO's contributions of personnel and supplies, reinforced as well by the distribution among projects of the contributions and loans provided by the other collaborating agencies.

Table 20

INTERNATIONAL CONTRIBUTIONS TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS
1968 AND ESTIMATED 1969

(U. S. dollars)

Country or other political unit	Date of initiation of total coverage	1968				1969 (estimated)			
		PAHO/SMF	WHO and WHO/TA	UNICEF (a)	AID (USA) (fiscal year) b)	PAHO/SMF	WHO and WHO/TA	UNICEF (a)	AID (USA) (fiscal year) b)
Argentina	Aug. 1959	27 583	-	76 000	-	26 666	-	30 000	-
Bolivia	Sep. 1958	68 175	-	46 000	-	59 734	-	48 000	-
Brazil	Aug. 1959	338 249	72 872	-	21 909	404 960	43 445	-	26 836
Colombia	Sep. 1958	155 907	-	492 000	-	176 990	-	594 000	-
Costa Rica	Jul. 1957	27 987	31 130	64 000	-	24 976	34 094	38 000	-
Cuba	1962	-	6 253	-	-	-	23 600	-	-
Dominican Republic ..	Jun. 1958	55 954	5 095	(c)	-	49 442	-	29 000	-
Ecuador	Mar. 1957	67 806	30 962	101 000	15 928	75 968	23 100	399 000	-
El Salvador	Jul. 1956	30 021	81 021	186 000	18 858	40 866	76 835	250 000	5 360
Guatemala	Aug. 1956	41 880	104 024	274 000	-	38 968	95 532	235 000	-
Guyana	Jan. 1947	39 993	28 847	6 000	-	68 536	-	10 000	-
Haiti	Jan. 1962	110 280	21 850	178 000	1 489 000	177 148	-	323 000	1 699 000
Honduras	Jul. 1959	27 420	51 006	182 000	18 130	29 848	54 320	153 000	13 160
Mexico	Jan. 1957	20 487	82 848	-	-	86 762	23 100	-	-
Nicaragua	Nov. 1958	64 122	83 371	186 000	19 833	46 752	78 123	120 000	7 413
Panama	Aug. 1957	22 561	78 931	53 000	-	17 576	87 176	138 000	-
Paraguay	Oct. 1957	59 141	11 968	200 000	33 475	91 084	-	210 000	51 605
Peru	Nov. 1957	110 281	95	98 000	-	101 376	-	41 000	-
British Honduras	Feb. 1957	15 620	158	15 000	-	18 076	-	4 000	-
French Guiana	Sep. 1963	-	-	-	-	600	-	-	-
Surinam	May 1958	87 255	2 484	2 000	-	91 394	-	9 000	-
Inter-country Projects and general services		282 742	447 661	-	405 184 ^{d)}	851 607	205 748	-	479 115 ^{d)}
Total		1 653 464	1 140 576	2 159 000	2 022 317	2 479 329	745 073	2 631 000	2 282 489

- None.

a) Rounded to the nearest hundred; shipping cost not included. b) AID loans are shown in Table 15. c) Requirements covered by funds previously allocated. d) Includes the Regional Office for Central America and Panama, the Regional Evaluation Office, and the Central America Malaria Research Station.