directing council

PAN AMERICAN HEALTH ORGANIZATION

XII Meeting

regional committee

WORLD HEALTH ORGANIZATION

XII Meeting

Havana, Cuba
August 1960

CD12/6 (Eng.)
CORRIGENDUM I
15 August 1960
ORIGINAL: ENGLISH-SPANISH

Topic 18: REPORT ON THE STATUS OF MALARIA ERADICATION IN THE AMERICAS - VIII REPORT

C O R R I G E N D U M

The following corrections should be made in the text of Document CD12/6:

Page	To read as follows:	
	Country or other political unit	Total coverage of malarious area
Page 9, Table 1	Peru	Yes(d)
	British Guiana	(e)

Note: The last sentence is note "e" which reads: "(e) Use of medicated salt in the remainder of the country began in second half of 1960."

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Topic 18: REPORT ON THE STATUS OF MALARIA ERADICATION IN THE AMERICAS

VIII REPORT

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REPORT ON THE STATUS OF MALARIA ERADICATION IN THE AMERICAS

VIII REPORT

Introduction

Following the custom of previous years, the Director has the honor to present to the XII Meeting of the Directing Council the Eighth Report on the status of the malaria eradication program in the Hemisphere.

As in the past, the document consists of three parts: the first refers to the status of the program in general and to the progress made by each country in particular; the second deals with special technical problems that have arisen and the measures that are being taken to solve them; and the third describes international cooperative activities directed toward improving the execution of the program, particularly those of PAHO/WHO. The data set forth cannot be used to evaluate the effectiveness of any given project, but are intended rather to indicate in general terms the present status of the program in the Americas.

This report was prepared on the basis of the data regularly transmitted to the Bureau by member countries. While the cooperation of the majority of National Malaria Services in this regard has been impressive, it is hoped that in future the Bureau will receive these data more rapidly and regularly so as to be able to improve the quality of the annual reports submitted to the Governing Bodies.

A significant example of cooperation is the fact that the countries have agreed to provide data for subdivisions such as spraying sectors at the end of each cycle. This information, which permits a more refined analysis of the situation in each country, cannot be included in a general document such as the present report. It can be stated that almost all the countries are making satisfactory progress in reducing the prevalence of the disease in those areas where there are no special epidemiological problems such as marked resistance of the vector to insecticides, or a strong inclination of the population to outdoor living during the hours of the vector's greatest activity.

I. STATUS OF THE PROGRAM

A. General picture.

In the period since the Seventh Report was issued, the following important events should be noted.

First, the governments' determination to continue the campaign, despite the technical and administrative difficulties encountered, should be emphasized. In several instances, vector resistance to insecticides, particularly to dieldrin, was confirmed. This necessitated the use of DDT, with a consequent increase in the number of spraying cycles, and therefore in local costs, owing to increased manpower requirements.

In the past year an improvement was observed in the administrative systems of certain National Malaria Eradication Services. Regrettably, progress in this respect has not been widespread, and the administrative situation in some Services still impedes the proper implementation of the planned program.

Epidemiological evaluation operations have improved appreciably, undoubtedly stimulated by the seminar sponsored by the Government of Brazil and the Bureau which was held in Petropolis in November-December 1959. The seminar offered the Directors of Services and the heads of Epidemiological Operations an opportunity to discuss their problems, to profit from the experience of their

STATUS OF THE MALARIA ERADICATION PROGRAM IN THE AMERICAS, 30 JUNE 1960.

colleagues in other countries, and to establish uniform methods for the economical and efficient development of evaluation procedures.

In accordance with the XXXII resolution of the XI Meeting of the Directing Council, methods of establishing and maintaining a Register of Areas Where Malaria has been Eradicated are being studied. The Director asked the III Meeting of the PASB Advisory Committee on Malaria Eradication for an opinion on this complex matter, and presented a report on the progress of the study to the 40th Meeting of the Executive Committee.

The countries continue to show an interest in coordinating their border area programs with those of their neighbors. The Bureau provided liaison and assisted in the preparation of a number of inter-country meetings in Central and South America.

In addition, certain important developments in national programs give promise of wide repercussions in the continent-wide malaria eradication campaign.

In August 1959 Argentina began total coverage of its remaining malarious areas. Brazil, which had begun the attack phase in the Amazon Valley in June 1959 with the compulsory use of medicated salt, started the first phase of total coverage in January 1960 in the States of Ceará, Paraiba, Rio Grande do Norte, and São Paulo. Cuba completed a preliminary survey, and the eradication plan is now under study. The Government of British Guiana signed a Tripartite Agreement with UNICEF and PASB for the early start of the program with chloroquinated salt to eliminate malaria from the interior of the country. Unfortunately, the program in Haiti could not as yet be resumed.

Table 1 summarizes the status of the continent-wide program, by countries, as of June 1960. The area and estimated population of those areas in the Hemisphere where malaria has never occurred or has disappeared spontaneously appear in Table 2, and Table 3 shows the countries and other political units which have claimed the eradication of malaria from their entire territory.

B. Extent of the problem.

At the end of 1959 the initially malarious area in the Americas was estimated to comprise 13,424,527 Km^2 with 101,548,000 inhabitants. These figures show an increase over those given in the VII report, owing to the inclusion of data for Cuba and the correction of figures for certain other countries.

With respect to the areas where malaria eradication has been claimed, Argentina, Venezuela, and British Guiana reported slight increases over their previous figures. The area under surveillance has also increased with the inclusion of figures for Brazil (State of São Paulo), Grenada, and St. Lucia. Spraying operations in St. Lucia were completed in 1959.

The increase of more than 100 per cent in the area in the attack phase arises from the inclusion of the States of Brazil where spraying has begun and the Amazon Valley where the Pinotti method (chloroquinated salt) is being applied, comprising in all 3,556,734 Km^2 with a population of 2,242,015.

Details for each country are given in Tables 4 and 5.

Table 6 presents a general summary of the various phases of the campign in the Americas, by are and population. The figures relating to "Transmission known to occur but no organized program of total coverage under way" refer to those States of Brazil that have not yet been included in the eradication program; partial protection in these areas is provided through a control program carried out by the National Department of Rural Endemic Diseases.

C. Field operations.

The magnitude of the program under way may be measured by the figures on personnel participating in national campaigns. Tables 7,8,9, and 10 present a variety of information on this subject

as of the end of 1958 and 1959. An increase is shown in the number of personnel at almost all levels, with the exception of physicians, engineers, and entomologists. In the case of entomologists the decrease is more apparent than real, since some persons without professional training who had been classified as entomologists in 1958 were placed in the category of entomological assistants in 1959.

Table 11 shows data on the various types of transport available to personnel in the Services. As was to be expected, there has been an increase over the previous year in almost all categories.

Detailed statistics of spraying operations in campaigns that receive international cooperation are given in Table 12.

The increase in the use of DDT shown in Table 12 is due mainly to the appearance of resistance to dieldrin. There has been a general increase in the daily output of spraymen.

The comparative analysis of spraying achievements in relation with spraying plans in Table 13 appears for the first time in this report. It is to be noted that in some countries the number of unsprayed houses is high and presents a real problem, particularly when such houses are located in rural areas.

As the campaigns progress, the number of blood slides taken and examined has been increasing, as can be seen in Table 14. A decrease in the percentage of positivity can be observed in the majority of programs, with the exception of those that are particularly affected by the resistance phenomenon or those that use one-year spraying cycles. It should be noted that in almost all programs there has been an increase in the number of Notification Posts, evaluators, and microscopists.

Table 15 compares for the years from 1956 to 1959 the number of malaria cases reported to the Bureau by health statistics services and the parasitologically confirmed cases reported by Malaria Eradication Services. It can be seen that despite the improvement shown, there are great differences between the two because many of the reported cases were not duly confirmed microscopically.

Table 16 contains additional information on the "active" and "passive" systems of evaluation. It can be seen that generally the "passive" system detects a proportionately larger number of malaria cases than the "active" system.

Four countries or other political units have claimed that malaria is eradicated in their entire territory, six have reported partial eradication, and nine that part or all of their territory is under surveillance. However, the Bureau has received information on the origin of confirmed malaria cases discovered in those areas during 1959 from only three countries. In Argentina, of 51 cases, 32 were classified as imported and 19 as introduced (secondary to known imported cases). In the United States of America, 27 of 31 cases were imported, 2 introduced, 1 classified as sporadic, and 1 induced. In the areas under surveillance in Venezuela, of 43 cases, 35 were imported, 7 introduced, and 1 induced while in the eradication area, of 60 cases, 52 were imported, 7 introduced, and 1 sporadic.

The efforts being made by governments may be appreciated in Table 17, which shows the national budgets devoted to malaria eradication programs. It is interesting to note that Grenada and St. Lucia, on entering the surveillance phase, have been able to reduce their budgets substantially.

II. SPECIAL TECHNICAL PROBLEMS

A. Anopheline resistance to insecticides.

Since the time when resistance first appeared in a vector species (A. albimanus, El Salvador, July 1958), the Bureau has collaborated with the countries in the intensification of tests designed to determine the susceptibility or resistance of anophelines. Table 18 shows the details of susceptibility tests performed by the end of 1959. In the case of Haiti, one test made in March 1960 was included because of the importance of finding marked resistance to dieldrin in one locality of the country. The number of tests performed and localities investigated increased considerably during the last six months of 1959, as compared to what had been accomplished up to that date, but much remains to be done.

Table 19 shows the number of areas in the various countries where susceptibility tests have been carried out. As can be seen, in most of the countries tests have been carried out in only a few of the malarious areas. The table cannot give an indication of the total effort involved, since only tests considered to have been satisfactorily completed have been included. Many of the investigations were made in areas where, because of the scarcity of mosquitoes at certain periods of the year, it was not possible to collect a sufficient number of specimens for susceptibility testing.

As can be seen in Table 20, A. albimanus is the vector species whose resistance to both dieldrin and DDT is most widespread geographically; it was found resistant to dieldrin in 12 countries or territories, in four of which it was also resistant to DDT. Nevertheless, the Bureau has deemed it advisable to recommend to the countries in question that they continue to use DDT except where epidemiological evidence indicates that resistance has reached exceptionally high levels. In most of the areas where susceptibility tests have indicated vector resistance, biological wall tests continue to show a high percentage mortality for this species, at least during the first months after DDT has been applied. Recent observations in Central America indicate that systematic and regular DDT coverage has reduced the number of malaria cases even in areas where susceptibility tests have revealed vector resistance.

In El Salvador, for example, a study of the results obtained from the examination of blood samples produced by Notification Posts suggests that DDT is effective in interrupting transmission. The country-wide application of this insecticide, replacing dieldrin, was begun in August 1958. In this study blood samples taken by the Service personnel during house-to-house visits were not included because the number of samples taken was irregular, ranging from none whatever up to thousands in different months. Whichever method is used, the case finding to evaluate the effectiveness of spraying operations is worthwhile only if the blood samples are obtained regularly from the same areas, at frequent intervals, in view of the seasonal variation in transmission. In the study in question, Notification Posts were considered the most acceptable source because they met this requirement.

As the Chart on the following page shows, the P. falciparum positivity percentage was lower during the period August-December 1959 than in the same period of 1958, even though the total positivity percentage did not begin to decrease substantially until February 1960. During the period March-May 1960 the lowest percentage positivity was recorded both for P. falciparum and the remaining cases, practically all of which were due to P. vivax since P. malariae is almost never found in the country. These observations suggest the need for continuing to spray with DDT at least until July 1961. By that time it may be possible to reach definitive conclusions on the insecticide's effectiveness in the eradication campaign.

B. Epidemiological problems.

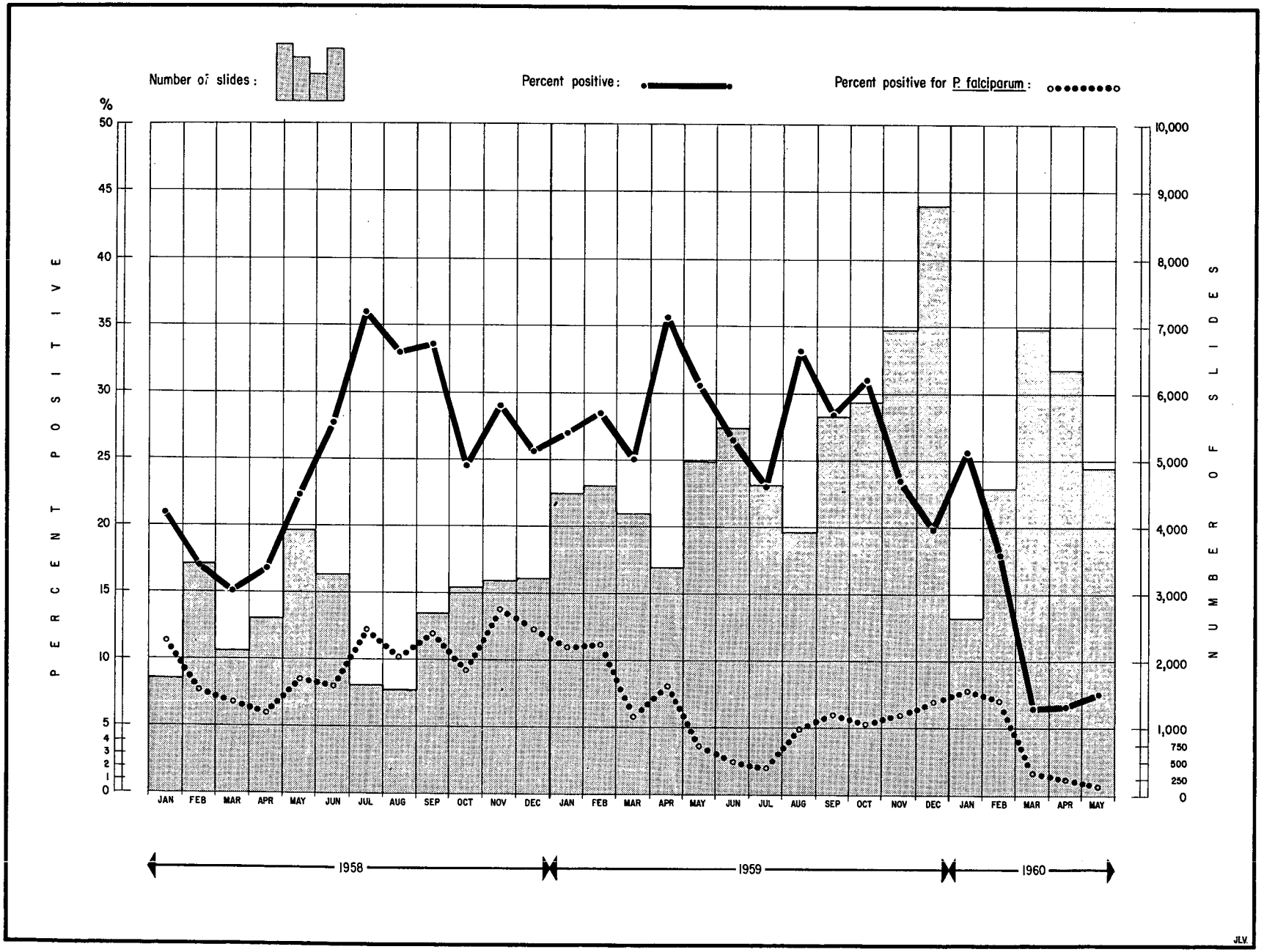
As was to be expected, as the malaria eradication campaign advances, there appear and will continue to appear epidemiological problems of a special nature that can be solved only by detailed investigation. Malaria has disappeared from large areas in most of the countries with several years of total coverage, where spraying has been done well and there has been no serious alteration of surfaces during the spraying cyles. Foci of transmission persist in some places, however, despite the fact that susceptibility tests indicate that the vector has not developed physiological resistance to the insecticide used.

When faced with this situation, a study should be made, among others, of the following epidemiological factors:

(a) Presence of a species considered to be a non-vector or one of secondary importance, which in reality could play an important rôle in transmission, and whose habits do not permit control through house spraying;

TREND OF MALARIA IN EL SALVADOR, 1958 TO MAY 1960.

Number of slides taken by voluntary collaborators, percent positive for all plasmodia, and percent positive for P. falciparum, by months.



(b) Habits of the population at risk, which may vary from remaining outdoors during a few night-time hours to the extreme of actual nomadism;

(c) Houses whose walls alter the insecticide chemically or which are of such flimsy construction that the vectors can find no adequate resting place where the lethal action of the insecticide can take effect;

(d) Extradomiciliary or peridomiciliary habits of vector species which were not previously known;

(e) Natural irritability to the vector of the insecticide in use, or a change of habits acquired through continuous contact with the insecticide over a period of years.

These factors indicate the need for intensifying epidemiological studies of the causes of persisting transmission, and of alternative measures which may be needed.

C. Insecticides: cycle and dosage.

As indicated in the last report, studies of new insecticides were begun in 1959 with the cooperation of the Ministry of Public Health of El Salvador and the Communicable Disease Center of the United States Public Health Service. On the basis of prior studies in the laboratory, it was decided to test certain preparations of malathion and Bayer 29493 in the field. The results of the first experiments indicate that the residual effect of these products is less than that of DDT or dieldrin, when they are applied at a rate of 1.0 grams per square meter.

In addition to investigating new insecticides, the Bureau considered it timely to examine the advisability of changing the dosage or cycle of the available insecticides, particularly DDT. For example, it is necessary to clarify whether, after DDT spraying at the commonly recommended dosage and cycle (2 grams per square meter every 6 months) has interrupted transmission, this interruption can be maintained with a lower concentration of insecticide and perhaps less frequent sprayings. The Bureau feels it has a duty to stimulate and sponsor studies of these and other vitally important questions, in the hope that they will make possible savings in the total cost of the campaigns without detracting from their effectiveness.

At the present time the experimental activities carried out in Central America are being extended to South America, so that the simultaneous study of several vector species will be possible.

III. INTERNATIONAL COOPERATION

Table 21 shows the number and type of personnel of the Organization assigned to country, inter-country, and regional projects. Headquarters staff and auxiliary administrative personnel assigned to the Zones are not included. The number of officials providing services directly to the countries has increased from 30 in 1957 to 86 in 1958, 115 in 1959, and 119 as of 30 June 1960. In view of the importance of problems relating to vector resistance and ecology, special efforts are being made to obtain the services of eight additional entomologists, who will be assigned directly to individual countries.

In order to facilitate the application of uniform procedures, a Manual of the Microscopic Diagnosis of Malaria (Scientific Publication No.46) was published in March 1960.

The Advisory Committee on Malaria Eradication held its III Meeting in Washington, D.C. from 14 to 16 March 1960. The Committee expressed its support of the program of investigations which the Bureau is developing, and emphasized the need to study any change in insecticide dosage and cycle carefully before it is adopted on a country-wide scale.

The Committee also pointed out the need to continue study of ways to prevent the loss of chloroquine in salt mixtures under conditions of varying humidity. Finally, the Committee recommended

that the WHO Expert Committee on Malaria consider the need for revising the criteria established for determining whether malaria has been eradicated in a given area.

The number of national personnel receiving training at international centers has tended to decline, owing to the great efforts made in previous years. Information on this subject appears in Table 22. The Malaria Eradication Training Center in Kingston, in which the Government of Jamaica, ICA, and the Bureau cooperate, continues to offer courses for English-speaking personnel but, owing to the reasons stated above, the majority of trainees come from other WHO Regions. In 1960 Venezuela held its XVII International Course and continued its traditional practice of offering fellowships to professionals from the countries in the Americas, for whom the Bureau provided the costs of international travel.

The National Malaria Eradication Commission of Mexico and the School of Hygiene and Public Health of the University of São Paulo, Brazil, with the financial aid of the Bureau, also continued to offer training facilities. It should be noted that upon completion of the formal courses at the various centers, all fellows are normally given an opportunity to visit programs under way in other countries for the purpose of increasing their knowledge and experience. In the organization of these study visits, the Bureau has received excellent cooperation from all national Malaria Eradication Services.

The Bureau has also arranged for a number of visits by senior officials to other Services.

Table 23 provides information on such fellowships awarded, but does not include the short-term fellowships granted to 39 professional officials who attended the Seminar on Evaluation Techniques held in Petropolis, Brazil, in November-December 1959.

As in previous years, the Bureau participated in the VII Meeting of Directors of National Malaria Eradication Services of Central America, Mexico, and Panama, which was held in San Salvador, El Salvador, from 16 to 21 May 1960.

The drugs required for Notification Post networks and for the radical cure of detected cases continue to be supplied by the Bureau. Table 24 shows how these drugs were distributed among the countries. In the same manner, Table 25 indicates the distribution of equipment and other materials provided by the Bureau as a supplement to the materials furnished by UNICEF and ICA.

Table 26 shows direct contributions of international organizations to national programs in the form of personnel, equipment, supplies, or fellowships. The costs of inter-country, regional, or headquarters projects are not included. The Bureau's total expenditures on the Malaria Eradication Program appear in the Financial Report of the Director.

Finally, it is important to emphasize the perfect understanding and harmony that exists in the relationships of PASB/WHO, UNICEF, and ICA. The change from dieldrin to DDT in several programs gave rise to increased operating costs, which were met thanks to the governments' interest and the laudable cooperation of the afore-mentioned agencies, who provided the means so that programs under way were not interrupted.

Table 1

STATUS OF THE MALARIA ERADICATION PROGRAM IN THE AMERICAS, 1960

Country or other political unit	Total coverage of malarious area	Date total coverage started	Country or other political unit	Total coverage of malarious area	Date total coverage started
Argentina	Yes	Aug. 1959	Paraguay	Yes	Oct. 1957
Bolivia	Yes	Sep. 1959	Peru	Yes	Nov. 1957
Brazil	(a)	Jan. 1960	Venezuela	Yes	1950
Colombia	Yes	Sep. 1958			
Costa Rica	Yes	July 1957	British Guiana	(d)	1947
Cuba	No(b)	-	British Honduras	Yes	Feb. 1957
Dominican Republic	Yes	June 1958	Dominica	Yes	June 1959
Ecuador	Yes	Mar. 1957	French Guiana	Yes	May 1948
El Salvador	Yes	July 1956	Grenada	Yes	Feb. 1957
Guatemala	Yes	Aug. 1956	Guadeloupe	Yes	Nov. 1955
Haiti	No(c)	-	Jamaica	Yes	Jan. 1958
Honduras	Yes	July 1959	Panama Canal Zone	Yes	1956
Mexico	Yes	Jan. 1957	St. Lucia	Yes	July 1956
Nicaragua	Yes	Nov. 1958	Surinam	Yes	May 1958
Panama	Yes	Aug. 1957	Trinidad and Tobago	Yes	Jan. 1958

- None

(a) Total coverage by spraying in the States of São Paulo, Paraiba, Ceará, and Rio Grande do Norte. Total coverage by use of medicated salt begun in June 1959 in the Amazon Valley (States of Pará, Amazonas and Territories of Amapá, Rio Branco, Acre and Guaporé. (b) Preparatory malaria survey conducted May 1959 - March 1960. (c) Total coverage begun in September 1958 and suspended in December 1958 owing to economic difficulties. Preparation of malaria survey for new program is under consideration. (d) Total coverage in coastal region only. Use of medicated salt in the remainder of the country began in second half of 1960.

Table 2

AREA AND POPULATION OF COUNTRIES OR OTHER POLITICAL UNITS IN THE AMERICAS WHERE MALARIA IS NOT KNOWN TO HAVE OCCURRED OR HAS DISAPPEARED WITHOUT ERADICATION MEASURES

Country or other political unit	Area (Km^2)	Estimated mid-1959 population (000)
Total	10 187 740	20 804
Canada	9 974 375	17 442
Uruguay	186 926	2 720
Antigua	442	58
Bahamas	11 396	138
Bermuda	53	47
Falkland Islands	11 961	2
Montserrat	83	15
Netherlands Antilles	961	195
St. Kitts-Nevis-Anguilla	396	60
St. Pierre and Miquelon	240	5
St. Vincent	389	84
Virgin Islands (United Kingdom)	174	9
Virgin Islands (United States)	344	32

Table 3

AREA AND POPULATION OF COUNTRIES OR OTHER POLITICAL UNITS IN THE AMERICAS WHERE MALARIA ERADICATION HAS BEEN CLAIMED AS OF MID-1959

Country or other political unit	Entire country		Original malarious area	
	Area (Km^2)	Estimated mid-1959 population (000)	Area (Km^2)	Estimated mid-1959 population (000)
Total	10098 948	188 201	2 322 691	45 361
Chile	741 767	7 465	55 287	119
United States of America	9346 751	177 702	2 257 809	42 500
Barbados	431	239	430	235
Martinique	1 102	268	300	174
Puerto Rico	8 897	2 347	8 865	2 333

Table 4

EXTENT OF THE MALARIAL PROBLEM BY AREA IN THE AMERICAS, 1959

Country or other political unit	Area (Km^2)				
	Total area of country	Original malarious area	Area with malaria eradication claimed (a)	Area under surveillance (b)	Area in the attack phase (c)
Total	19 566 509	13 424 527	555 976	213 865	8 866 890
Argentina	2 778 412	270 400	26 600	23 000	220 800
Bolivia	1 098 581	842 018	-	-	842 018
Brazil(excl. São Paulo)	8 266 622	7 338 679	115 887	-	3 618 131
Brazil (São Paulo)	247 843	228 058	-	117 740	90 533
Colombia	1 138 338	1 026 433	-	-	1 026 433
Costa Rica	50 900	31 526	-	-	31 526
Cuba	114 524	36 602	-	-	...
Dominican Republic	48 280	40 996	-	-	40 996
Ecuador	300 000	153 489	-	-	153 489
El Salvador	21 146	19 300	-	-	19 300
Guatemala	108 889	80 380	-	-	80 380
Haiti	27 750	19 098	-	-	...
Honduras	112 088	87 390	-	-	87 390
Mexico	1 969 367	978 185	-	36 790	941 395
Nicaragua	148 000	127 199	-	-	127 199
Panama	74 470	68 497	-	-	68 497
Paraguay	406 752	42 286(d)	-	-	80 000
Peru	1 249 049	943 228	-	5 110	938 118
Venezuela	912 050	600 000	407 945	30 032	162 023
British Guiana	214 970	214 970	5 180	-	155 400
British Honduras	22 965	22 965	-	-	22 965
Dominica	789	152	-	-	152
French Guiana	91 000	90 000	-	...	...
Grenada	344	185	-	34	151
Guadeloupe	1 780	1 136	69	752	315
Jamaica	11 424	11 424	-	-	11 424
Panama Canal Zone	1 432	1 432	-	-	1 432
St. Lucia	616	381	-	381	-
Surinam	143 000	143 000	-	-	143 000
Trinidad and Tobago	5 128	5 118	295	26	4 823

Note: Data based on reports of Governments to the World Health Organization at the end of 1959, monthly reports to the Pan American Sanitary Bureau, and country plans for malaria eradication.

... No information.
- None
(a) 3 or more years without autochtonous cases. (b) Less than 3 years without autochtonous cases. (c) Spraying or other anti-malarial measures being carried out. (d) Provisional; the full extent of the malarious area is not yet determined.

Table 5

EXTENT OF THE MALARIAL PROBLEM BY POPULATION IN THE AMERICAS, 1959

Country or other political unit	Population (000)				
	Total estimated mid-1959	In original malarious area	In area with malaria eradication claimed(a)	In area under surveillance (b)	In area in the attack phase (c)
Total	186 590	101 548	7 495	9 349	56 292
Argentina	20 614	2 263	174	737	1 351
Bolivia	3 316	888	-	-	888
Brazil (excl. S. Paulo)	52 357	30 569	3 193	-	4 862
Brazil (São Paulo)	11 859	10 185	-	7 493	2 692
Colombia	13 824	9 000	-	-	9 000
Costa Rica	1 126	361	-	-	361
Cuba	6 400	2 100	-	-	...
Dominican Republic	2 894	2 418	-	-	2 418
Ecuador	4 169	2 346	-	-	2 346
El Salvador	2 520	1 440	-	-	1 440
Guatemala	3 618	1 544	-	-	1 544
Haiti	3 464	2 800	-	-	...
Honduras	1 887	1 347	-	-	1 347
Mexico	33 304	18 116	-	59	16 979
Nicaragua	1 461	1 317	-	-	1 317
Panama	1 024	960	-	-	960
Paraguay	1 718	749(d)	-	-	861
Peru	10 524	4 737	-	14	4 723
Venezuela	6 512	4 610	3 538	685	387
British Guiana	559	559	520	-	30
British Honduras	90	90	-	-	90
Dominica	68	13	-	-	13
French Guiana	32	32	-	...	...
Grenada	92	34	-	6	28
Guadeloupe	265	219	35	133	51
Jamaica	1 689	1 689	-	-	1 689
Panama Canal Zone	46	46	-	-	46
St. Lucia	94	62	-	62	-
Surinam	275	275	-	-	275
Trinidad and Tobago	789	789	35	160	594

Note: Data based on reports of Governments to the World Health Organization at the end of 1959, monthly reports to the Pan American Sanitary Bureau, and country plans for malaria eradication.

... No information.
- None
(a) 3 or more years without autochtonous cases. (b) Less than 3 years without autochtonous cases.
(c) Spraying or other anti-malarial measures being carried out. (d) Provisional; the full extent of the malarious area is not yet determined.

Table 6

STATUS OF MALARIA ERADICATION BY AREA AND POPULATION IN THE AMERICAS, 1959

Status	Area		Population	
	Km^2	Per cent	Thousands	Per cent
Total.....	39 726 762	100.0	394 606	100.0
Malaria not known to have occurred or has disappeared wothout eradication measures(a) ..	24 105 979	60.7	248 686	63.0
Malaria eradication claimed	2 878 667	7.2	52 856	13.4
Under surveillance	213 865	0.5	9 349	2.4
In the attack phase	8 866 890	22.3	56 292	14.3
Eradication program in the preparatory phase(b).....	262 892	0.7	9 261	2.3
Transmission known to occur but no organized program of total coverage under way(c)	3 398 469	8.6	18 162	4.6

(a) Including such areas in countries where malaria eradication has been claimed, or where malaria is still present in other regions. (b) Malarious areas of Cuba, Haiti, and the Brazilian States of Alagoas, Paraná, Pernambuco, and Sergipe. (c) Remainder of malarious areas of Brazil.

Table 7

PERSONNEL EMPLOYED IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF 31 DECEMBER 1958 AND 1959

Title	31 December 1958	31 December 1959
Total	14 773	16 242
Physicians	270	249
Engineers	96	92
Entomologists	38	26
Entomological assistants	83	132
Microscopists	312	383
Accountants	6	7
Administrators	63	81
Administrative assistants	341	412
Statisticians and statistical assistants	41	51
Disbursing officers	42	51
Storekeepers	75	90
Assistant storekeepers	48	88
Draftsmen	70	89
Secretaries	426	421
Sector chiefs	392	429
Squad chiefs	1 356	1 397
Spraymen	6 846	7 487
Evaluation inspectors	135	166
Evaluators	1 142	1 425
Mechanics and assistant mechanics	265	265
Drivers	841	866
Motorboat-men	115	125
Boatmen	82	36
Watchmen	50	65
Laborers	566	396
Others	1 072	1 413

Note: Data based on reports of Governments to the World Health Organization at the end of 1959 and monthly reports to the Pan American Sanitary Bureau.

Table 8

PROFESSIONAL AND TECHNICAL PERSONNEL EMPLOYED IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF 31 DECEMBER 1958 AND 1959

Country or other political unit	Total		Physicians		Engineers		Entomologists		Entomological assistants	
	1958	1959	1958	1959	1958	1959	1958	1959	1958	1959
Total	487	491	270	245	96	92	38	25	83	129
Argentina	11	16	9	10	1	2	-	-	1	4
Bolivia	21	26	12	11	3	9	1	1	5	5
Brazil(São Paulo)	29	41	17	18	2	9	10	1	-	13
Colombia	56	40	29	25	23	7	-	1	4	7
Costa Rica	5	8	1	1	2	2	-	1	2	4
Dominican Republic	7	5	2	2	2	2	1	-	2	1
Ecuador	17	19	10	10	2	2	-	1	5	6
El Salvador	8	12	2	3	1	1	1	1	4	7
Guatemala	8	9	3	4	2	1	1	1	2	3
Haiti	16	-	5	-	7	-	1	-	3	-
Honduras	3	5	2	1	-	-	1	1	-	3
Mexico	181	183	112	101	36	42	4	6	29	34
Nicaragua	10	10	4	4	-	-	1	1	5	5
Panama	7	5	1	1	1	1	1	1	4	2
Paraguay	6	8	4	3	1	1	1	1	-	3
Peru	29	29	14	14	7	7	8	1	-	7
Venezuela	31	31	25	25	4	4	2	2	-	-
British Guiana	2	2	1	1	-	-	1	1	-	-
British Honduras	1	2	1	1	-	-	-	-	-	1
Dominica	7	1	6	1	1	-	-	-	-	-
French Guiana	2	3	1	1	-	-	1	1	-	1
Grenada	1	1	1	1	-	-	-	-	-	-
Guadeloupe	2	2	1	1	-	-	1	1	-	-
Jamaica	3	3	3	2	-	1	-	-	-	-
Panama Canal Zone	3	9	1	1	1	1	1	1	-	6
St. Lucia	1	1	1	1	-	-	-	-	-	-
Surinam	2	1	1	1	-	-	-	-	1	-
Trinidad and Tobago	18	19	1	1	-	-	1	1	16	17

- None

Table 9

FIELD PERSONNEL EMPLOYED IN SPRAYING OPERATIONS IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF 31 DECEMBER 1958 AND 1959

Country or other political unit	Total		Sector chiefs		Squad chiefs		Spraymen		Drivers		Motorboat-men	
	1958	1959	1958	1959	1958	1959	1958	1959	1958	1959	1958	1959
Total	9 550	10 280	392	419	1 356	1 397	6 846	7 487	841	852	115	125
Argentina	167	193	9	10	28	32	93	110	37	41	-	-
Bolivia	282	315	32	31	47	23	158	209	38	40	7	12
Brazil(São Paulo) ..	223	441	12	20	55	30	122	306	34	83	-	2
Colombia.....	1 923	1 590	43	53	151	102	1 418	1 202	239	167	72	66
Costa Rica	111	112	3	3	15	15	78	84	15	10	-	-
Dominican Republic	208	210	6	6	28	28	146	142	28	34	-	-
Ecuador.....	318	313	15	16	50	43	232	227	19	21	2	6
El Salvador	311	419	12	12	49	65	204	295	46	47	-	-
Guatemala	324	528	6	16	21	72	261	386	36	53	-	1
Haiti(a)	330	-	13	-	63	-	247	-	7	-	-	-
Honduras	218	318	10	10	29	42	145	221	32	44	2	1
Mexico	2 592	3 279	101	132	457	589	1 997	2 519	33	31	4	8
Nicaragua.....	181	310	6	8	22	47	125	205	24	45	4	5
Panama.....	175	157	7	7	27	25	136	120	5	5	-	-
Paraguay	129	137	4	4	16	16	83	86	24	27	2	4
Peru	492	365	22	14	65	56	324	249	81	40	-	6
Venezuela.....	754	770	48	41	122	91	520	570	53	59	11	9
British Guiana.....	66	62	1	-	9	7	53	51	3	4	-	-
British Honduras...	48	26	8	2	10	4	30	19	-	1	-	-
Dominica	-	8	-	1	-	1	-	5	-	1	-	-
French Guiana.....	30	35	-	2	9	9	20	20	1	4	-	-
Grenada	16	15	1	1	2	1	10	10	3	3	-	-
Guadeloupe.....	40	40	1	1	6	6	30	30	3	3	-	-
Jamaica	243	387	19	17	33	56	149	266	42	48	-	-
Panama Canal Zone.	26	24	2	2	4	-	16	20	2	2	2	-
St. Lucia.....	26	-	2	-	4	-	20	-	-	-	-	-
Surinam	87	95	4	7	13	16	56	58	5	9	9	5
Trinidad and Tobago.....	230	131	5	3	21	21	173	77	31	30	-	-

... No information
- None
(a) Program suspended.

Table 10

PERSONNEL EMPLOYED IN EVALUATION OPERATIONS IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF 31 DECEMBER 1958 AND 1959

Country or other political unit	Total		Evaluation inspectors		Evaluators		Microscopists	
	1958	1959	1958	1959	1958	1959	1958	1959
Total	1 589	1 972	135	229	1 142	1 360	312	383
Argentina	108	100	15	14	77	70	16	16
Bolivia	35	39	-	-	22	24	13	15
Brazil(São Paulo)	18	76	-	4	-	26	18	46
Colombia	214	246	6	33	183	166	25	47
Costa Rica	25	28	1	3	18	18	6	7
Dominican Republic	18	12	-	-	14	7	4	5
Ecuador	44	57	-	2	30	36	14	19
El Salvador	28	23	4	3	20	16	4	4
Guatemala	23	44	1	4	11	29	11	11
Haiti	46	-	6	-	25	-	15	-
Honduras	37	40	-	4	18	22	19	14
Mexico	257	514	35(a)	65	182	386	40	63
Nicaragua	21	40	-	2	15	32	6	6
Panama	39	38	2	2	25	25	12	11
Paraguay	15	28	6	6	-	13	9	9
Peru	96	99	-	1	70	66	26	32
Venezuela	436	422	40	81	353(b)	301	43	40
British Guiana	1	1	-	-	-	-	-	1
British Honduras	9	8	1	1	8	4	-	3
Dominica	15	5	13	-	2	4	-	1
French Guiana	-	-	-	-	-	-	-	-
Grenada	4	3	-	-	3	2	1	1
Guadeloupe	12	7	1	-	9	4	2	3
Jamaica	31	46	1	-	16	32	14	14
Panama Canal Zone	4	-	2	-	-	-	2	-
St. Lucia	4	8	-	2	3	5	1	1
Surinam	10	19	-	1	7	14	3	4
Trinidad and Tobago	39	69	1	1	31	58	7	10

- None

(a) Assistant medical malariologists and field technicians. (b) Rural visitors.

Table 11

MEANS OF TRANSPORT IN MALARIA ERADICATION PROGRAMS IN THE AMERICAS AT 31 DECEMBER 1959

Country or other political unit	Total (all means of transport)	Trucks (3 tons) or more)	Other trucks and pickups	Jeeps	Automobiles(a)	Motorcycles	Bicycles	Motorboats	Other boats	Saddle and pack animals	Other
Total	6 143	160	1 300	681	172	21	141	194	153	3 318	3
Argentina	132	13	81	12	12	2	12	-	-	-	-
Bolivia	292	3	3	62	1	-	1	14	-	208	-
Brazil(São Paulo)	168	9	136	10	13	-	-	-	-	-	-
Colombia	1 076	19	178	72	31	-	5	8	61	701	1(b)
Costa Rica	26	1	12	7	-	-	-	6	-	-	-
Dominican Republic	44	1	29	10	4	-	-	-	-	-	-
Ecuador	185	6	26	29	-	-	1	15	3	105	-
El Salvador	63	1	33	27	1	-	-	1	-	-	-
Guatemala	84	47	18	6	-	-	2	4	7	-	-
Honduras	83	2	5	21	35	-	-	1	-	19	-
Mexico	2 311	16	415	201	14	-	-	14	1	1 650	-
Nicaragua	50	2	28	15	2	-	-	3	-	-	-
Panama	70	2	35	17	-	-	-	16	-	-	-
Paraguay	41	-	21	8	1	-	-	3	4	4	-
Peru	263	9	121	67	9	-	-	57	-	-	-
Venezuela	1 057	5	89	83	30	4	114	27	74	631	-
British Guiana	7	-	1	-	3	-	1	1	1	-	-
British Honduras	11	-	7	2	1	-	-	1	-	-	-
Dominica	7	-	2	-	-	5	-	-	-	-	-
French Guiana	10	1	4	1	2	-	1	-	1	-	-
Grenada	6	-	2	1	-	3	-	-	-	-	-
Guadeloupe	7	1	3	3	-	-	-	-	-	-	-
Jamaica	67	11	31	15	10	-	-	-	-	-	-
Panama Canal Zone	13	-	7	-	-	-	-	6	-	-	-
St. Lucia	6	-	1	1	-	4	-	-	-	-	-
Surinam	33	2	3	2	2	3	4	17	-	-	-
Trinidad and Tobago	31	9	9	9	1	-	-	-	1	-	2(c)

- None

(a) Passenger or cargo vehicles. (b) Airplane. (c) Tractor.

Table 12

SPRAYING OPERATIONS OF MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF MARCH 1960

Year of total coverage	Date	Houses sprayed				Total number of sprayings in year	Insecticide used (kgs. technical)		Average number of houses sprayed per spray - man - day
		D. D. T.		Dieldrin					
		Cycle	Number sprayed	Cycle	Number sprayed		D. D. T.	Dieldrin	
ARGENTINA. Total coverage began 1 August 1959									
1st	Aug. 59-Apr. 60	1st	55 849(a)	-	-				
			2 146(b)	-	-	115 029	27 445	-	...
		2nd	53 586(a)	-	-				
			3 448(b)	-	-	110 620			
BOLIVIA. Total coverage began 1 September 1958									
1st	Sep. 58-Aug. 59	1st	116 572	1st	10 910		87 408	1 206	7.5
		2nd	129 119			256 601			
2nd	Sep. 59-Feb. 60	3rd	136 601	2nd	2 987	139 588	43 585	347	7.7
COLOMBIA. Total coverage began 29 September 1958									
1st	Oct. 58-Sep. 59	1st	1 181 235						
		2nd	1 176 392	-	-	2 357 627	1 120 634	-	7.9
2nd	Oct. 59-Jan. 60	3rd	816 850	-	-	816 850	337 787	=	9.4
COSTA RICA. Total coverage began 15 July 1957									
1st	Jul. 57-Aug. 58	1st	53 297						
		2nd	58 624	-	-	111 921	49 204	-	6.0
2nd	Sep. 58-Sep. 59	3rd	60 800						
		4th	63 063	-	-	123 863	61 749	-	7.1
3rd	Oct. 59-Feb. 60	5th	51 556	-	-	5 556	27 136	-	8.4
DOMINICAN REPUBLIC. Total coverage began 16 June 1958									
1st	Jun. 58-Jun. 59	-	-	1st	395 597	395 597	-	40 503	11.4
2nd	Jul. 59-Mar. 60	-	-	2nd	236 579	236 579	-	18 174	10.3
ECUADOR. Total coverage began 28 March 1957									
1st	Mar. 57-Mar. 58	1st and 2nd	63 284	1st	257 697	320 981	37 345	29 372	8.0
2nd	Apr. 58-Mar. 59	3rd	50 089	2nd			60 618	39 335	7.7
		4th	83 018		271 417	404 524			
3rd	Apr. 59-Jan. 60	5th	72 370	3rd			54 016	29 090	9.1
		6th	61 945		237 206	371 521			
EL SALVADOR. Total coverage began 1 July 1956									
1st	Jul. 56-Jul. 57	1st	260 035	1st	128 839	562 411	211 505	9 001	8.7
		2nd	173 537						
2nd	Aug. 57-Jul. 58	3rd	126 329	2nd	202 728	440 783	109 864	32 919	9.4
		4th	111 726						
3rd	Aug. 58-Jul. 59	5th	273 788	-	-	544 507	282 841	-	8.8
		6th	270 719						
4th	Aug. 59-Feb. 60	7th	265 361	-	-	298 385	171 484	-	7.7
		8th	33 024						
GUATEMALA. Total coverage began 1 August 1956									
1st	Aug. 56-Aug. 57	-	-	1st	306 306	306 306	-	...	8.4
2nd	Sep. 57-Sep. 58	-	-	2nd	331 090	331 090	-	38 499	8.6
3rd	Oct. 58-Oct. 59	1st	301 329	-	-				
		2nd	357 104			658 433	322 137	-	8.2
4th	Nov. 59-Feb. 60	3rd	185 517	-	-	185 517	98 478	-	6.7
HONDURAS. Total coverage began 15 July 1959									
1st	Jul. 59-Mar. 60	1st	236 963						
		2nd	121 630	-	-	358 593	141 584	-	10.4
MEXICO. Total coverage began 1 January 1957									
1st	1957	1st	2 143 023	1st	678 726	5 120 701	1 710 381	67 005	9.6
		2nd	2 298 952						
2nd	1958	3rd	2 103 570	2nd	1 217 556	5 292 683	1 680 191	135 051	10.4
		4th	1 971 557						
3rd	1959	5th	3 050 952	3rd	292 301	6 562 593	...	...	10.6
		6th	3 219 340						

- None.
... No information.
(a) Six-month cycle. (b) Twelve-month cycle.

Table 12 (Concluded)

SPRAYING OPERATIONS OF MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF MARCH 1960

Year of total coverage	Date	Houses sprayed				Total number of sprayings in year	Insecticide used (kgs. technical)		Average number of houses sprayed per spray - man - day
		D. D. T.		Dieldrin			D. D. T.	Dieldrin	
		Cycle	Number sprayed	Cycle	Number sprayed				
NICARAGUA. Total coverage began 10 November 1958									
1st	Nov. 58-Dec. 59	1st	205 930	-	-	424 575	153 915	-	9.8
		2nd	218 645						
2nd	Jan.-Mar. 60	3rd	121 561	-	-	121 561	47 341	-	9.3
PANAMA. Total coverage began 19 August 1957									
1st	Aug. 57-Aug. 58	-	-	1st	155 963	155 963	-	18 556	6.5
2nd	Sep. 58-Aug. 59	-	-	2nd	154 638	154 638	-	31 754	6.9
3rd	Sep. 59-Feb. 60	-	-	3rd	70 461	70 461	-	8 822	7.5
PARAGUAY. Total coverage began 30 October 1957									
1st	Nov. 57-Oct. 58	-	-	1st	148 626	148 626	-	15 610	11.0
2nd	Nov. 58-Oct. 59	-	-	2nd	161 261	161 261	-	17 848	14.3
PERU. Total coverage began 17 November 1957									
1st	Nov. 57-Oct. 58	1st and 2nd	286 764(d) 70 266(b)	1st	121 666	478 696	152 288	14 356	7.8
2nd	Nov. 58-Oct. 59	3rd and 4th	253 600	2nd	128 932	382 532	103 098	15 742	8.3
3rd	Nov. 59-Mar. 60	5th	148 690	3rd	106 688	255 378	71 905	11 932	8.3
BRITISH HONDURAS. Total coverage began 4 February 1957									
1st	Feb. 57-Jan. 58	-	-	1st	17 082	17 082	-		...
2nd	Feb. 58-Dec. 58	1st	6 419		11 873(a)	39 769	1 396	514	
	(c)	2nd	6 537	2nd	7 470(b)			215	8.1
3rd	May 59-Apr. 60(d)	3rd	17 516	-	-	33 030		-	7.5
		4th	15 514	-	-		10 772	-	8.6
DOMINICA. Total coverage began 8 June 1959									
1st	Jun. 59-Mar. 60	1st	2 748	-	-	4 838	1 172	-	7.8
		2nd	2 090						
GRENADA. Total coverage began 12 February 1957(e)									
1st	Feb. 57-Jan. 58	1st	7 237	-	-	15 157	4 144	-	7.2
		2nd	7 920						
2nd	Feb. 58-Jan. 59	3rd	7 942	-	-	16 082	4 969	-	6.5
		4th	8 140						
3rd	Feb. 59-Jan. 60	5th	8 077	-	-	15 886	4 996	-	7.2
		6th	7 809						
JAMAICA. Total coverage began 2 January 1958									
1st	1958	-	-	1st	271 514	271 514	-	16 413	8.9
2nd	Jan.-Sep. 59	1st	88 862	2nd	181 319	270 181	20 112	11 265	9.9
3rd	Oct. 59-Jan. 60	2nd	171 514	-	-	171 514	66 069	...	9.8
ST. LUCIA. Total coverage began 16 January 1956(f)									
1st	Jan. 56-Jan. 57	1st	9 815	-	-	19 986	5 420	-	...
		2nd	10 171						
2nd	Feb.-Dec. 57	3rd	12 251	-	-	24 487	4 495	-	...
		4th	12 236						
3rd	Jan. 58-Jan. 59	5th	15 817	-	-	30 741	7 451	-	6.0
		6th	14 924						
4th	Feb.-Sep. 59	7th	15 347	-	-	15 347	3 678	-	6.5
SURINAM. Total coverage began 15 May 1958									
1st	May 58-Apr. 59	1st	31 299	1st(g)	7 484	78 994	22 515	389	6.3
		2nd	40 211						
2nd	May 59-Mar. 60	3rd	37 563	2nd(g)	11 913	80 370	17 689	667	8.0
		4th	30 764						
TRINIDAD AND TOBAGO. Total coverage began 2 January 1958									
1st	Jan.-Oct. 58	-	-	1st	117 077	117 077	-	16 240	7.1
2nd	1959	1st(h)	68 290	2nd	81 108	168 835	22 290	9 930	9.0
3rd	Jan.-Apr. 60	2nd	76 119	-	-	76 119	25 714		11.7

(a) Sprayed once. (b) Sprayed twice. (c) In the period January-April 1958, spraying was limited to emergency spraying of 1 915 houses with DDT and 210 with Dieldrin. (d) No spraying in September and October 1959 because of re-training of personnel. (e) Spraying suspended and surveillance phase begun, February 1960. (f) Spraying suspended and surveillance phase begun, October 1959. (g) Houses sprayed with dieldrin are shown for dates corresponding to the DDT year; the actual spray year for dieldrin is July-June. (h) About 1/3 of the houses were sprayed twice during the year. - None. ... No information.

Table 13

ANALYSIS OF SPRAYING ACHIEVEMENTS OF MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF MARCH 1960

Year of total coverage	Date	Target number of house sprayings	Number of sprayings	Number of houses not sprayed (a)			
				Not sprayable	Refused entry to sprayman	Closed	Total
ARGENTINA. Total coverage began 1 August 1959							
1st	Aug. 59-Apr. 60	174 057	115 029	4 044	23	1 845	5 912
BOLIVIA. Total coverage began 1 September 1958							
1st	Sep. 58-Aug. 59	275 618	256 601	12 482	862	19 094	32 438
2nd	Sep. 59-Feb. 60	158 594	139 561	7 947	242	8 760	16 949
COLOMBIA. Total coverage began 29 September 1958							
1st	Oct. 58-Sep. 59	2 476 283	2 357 627	82 822	85 476	57 804	226 102
2nd	Oct. 59-Jan. 60	1 273 295	816 850	26 293	8 892	33 495	68 680
COSTA RICA. Total coverage began 15 July 1957							
1st	Jul. 57-Aug. 58	125 700	117 032	0	0	0	0
2nd	Sep. 58-Sep. 59	119 271	123 863	0	0	0	0
3rd	Oct. 59-Feb. 60	63 259	43 857	0	0	0	0
DOMINICAN REPUBLIC. Total coverage began 16 June 1958							
1st	Jun. 58-Jun. 59	386 120	395 597	...	...	...	5 706
2nd	Jul. 59-Mar. 60	400 000	236 579	...	...	...	16 883
ECUADOR. Total coverage began 28 March 1957							
1st	Mar. 57-Mar. 58	329 140	320 981	...	...	...	...
2nd	Apr. 58-Mar. 59	383 023	404 524	3 168	4 112	9 618	16 898
3rd	Apr. 59-Jan. 60	413 693	371 521	2 287	1 542	5 255	9 084
EL SALVADOR. Total coverage began 1 July 1956							
1st	Jul. 56-Jul. 57	...	562 411	...	...	...	218
2nd	Aug. 57-Jul. 58	...	440 783	0	0	0	0
3rd	Aug. 58-Jul. 59	573 252	544 507	0	101	355	456
4th	Aug. 59-Feb. 60	540 093	298 385	0	278	954	1 232
GUATEMALA. Total coverage began 1 August 1956							
1st	Aug. 56-Aug. 57	272 177	306 306	...	...	...	758(b)
2nd	Sep. 57-Sep. 58	321 975	331 090	...	...	...	1 518
3rd	Oct. 58-Oct. 59	682 000	658 433	...	...	...	6 541
4th	Nov. 59-Feb. 60	373 641	185 517	...	...	...	1 990
HONDURAS. Total coverage began 15 July 1959							
1st	Jul. 59-Mar. 60	474 497	358 593	3 404	339	1 649	5 392
MEXICO. Total coverage began 1 January 1957							
1st	1957	3 089 349	5 120 701	77 537	71 619(c)		149 156
2nd	1958	5 329 697	5 292 683	102 485	90 686(c)		193 171
3rd	1959	6 645 174	6 562 593	95 178	117 107(c)		212 285
NICARAGUA. Total coverage began 10 November 1958							
1st	Nov. 58-Dec. 59	436 624	424 575	6 802	2 099	7 282	16 183
2nd	Jan.-Mar. 1960	226 831	121 561	3 223	988	3 299	7 510
PANAMA. Total coverage began 19 August 1957							
1st	Aug. 57-Aug. 58	152 957	155 963	...	...	...	5 047
2nd	Sep. 58-Aug. 59	161 700	154 638	2 247	267	5 857	8 371
3rd	Sep. 59-Feb. 60	165 100	70 461	1 120	407	4 103	5 630
PARAGUAY. Total coverage began 30 October 1957							
1st	Nov. 57-Oct. 58	126 902	148 626	0	0	651	651
2nd	Nov. 58-Oct. 59	150 033	161 261	0	90	1 022	1 112

Note: Data based on monthly reports by Governments to the Pan American Sanitary Bureau.

... No information.

(a) When follow-up spraying is done, the figures represent the net number of houses unsprayed at the end of the spraying year. (b) Incomplete. (c) Including houses not sprayed for unspecified other reasons.

Table 13 (Concluded)

ANALYSIS OF SPRAYING ACHIEVEMENTS OF MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF MARCH 1960

Year of total coverage	Date	Target number of house sprayings	Number of sprayings	Number of houses not sprayed (a)			
				Not sprayable	Refused entry to sprayman	Closed	Total
PERU. Total coverage began 17 November 1957							
1st	Nov. 57-Oct. 58	527 081	478 696	522(b)	72	42 201	42 795
2nd	Nov. 58-Oct. 59	472 883	382 532	13 368	2 142	16 016	31 526
3rd	Nov. 59-Mar.60	473 091	255 378	6 521	580	6 955	14 056
BRITISH HONDURAS. Total coverage began 4 February 1957							
1st	Feb. 57-Jan. 58	17 655	17 082	...	...	...	...
2nd	Feb. - Nov.1958	23 711	39 769	0	0	427	427
3rd	May 59-Apr. 60	36 314	33 030	354	3	365	722
DOMINICA. Total coverage began 8 June 1959							
1st	Jun. 59-Mar. 60	5 779	4 838	24	101	160	285
GRENADA. Total coverage began 12 February 1957(c)							
1st	Feb. 57-Jan. 58	15 080	15 157	...	...	...	856
2nd	Feb. 58-Jan. 59	16 491	16 491	...	...	...	445
3rd	Feb. 59-Jan. 60	16 696	15 886	230	15	577	822
JAMAICA. Total coverage began 2 January 1958							
1st	1958	278 909	271 514	7 395	9	0	7 404
2nd	Jan.-Sep. 1959	279 729	270 181	5 217	29	1 834	7 080
3rd	Oct. 59-Jan. 60	279 729	171 514	4 037	22	567	4 626
ST. LUCIA. Total coverage began 16 January 1956(d)							
1st	Jan. 56-Jan. 57	...	19 986	...	...	...	...
2nd	Feb. - Dec. 1957	24 487	24 487	0	0	0	0
3rd	Jan. 58-Jan. 59	33 638	30 741	...	...	...	1 695
4th	Feb.-Sep. 1959	15 325	15 347	13	32	381	426
SURINAM. Total coverage began 4 May 1958							
1st	May 58-Apr. 59	71 080	78 994	196	124	4 980	5 300
2nd	May 59-Mar. 60	86 470	80 370	140	942	2 427	3 509
TRINIDAD AND TOBAGO. Total coverage began 2 January 1958							
1st	Jan. - Oct. 1958	120 351	117 077	...	...	...	2 519
2nd	1959	132 000	168 835	27	1	477	505
3rd	Jan.-Apr. 1960	245 510	76 119	33	6	1 254	1 293

... No information.

(a) When follow-up spraying is done, the figures represent the net number of houses unsprayed at the end of the spraying year. (b) July to October 1958. (c) Spraying suspended and surveillance phase begun, February 1960. (d) Spraying suspended and surveillance phase begun, October 1959.

Table 14

EVALUATION OPERATIONS OF MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF MARCH 1960

Year of total coverage	Date	Number of inhabitants directly protected by spraying	Number of slides examined	Number of positive slides	Per cent positive	Species of plasmodia			No. of notification posts	No. of evaluators	No. of microscopists
						P. falciparum	P. vivax	P. malariae			
ARGENTINA. Total coverage began 1 August 1959											
1st	Aug. 59-Mar. 60	(a) 352 159	43 039	1 732	4.0	4	1 728	0	711	62	16
BOLIVIA. Total coverage began 1 September 1958											
1st	Sep. 58-Aug. 59	627 210	47 554	1 843	3.9	273	1 268	302	1 300	23	9
2nd	Sep. - Dec. 1959	453 284	36 208	384	1.1	23	294	67	1 302	23	10
COLOMBIA. Total coverage began 29 September 1958											
1st	Oct. 58-Sep. 59	6 597 002	205 343	2 626	1.3	731	1 877	18	267	160	45
2nd	Oct. 59-Jan. 60	4 454 809	166 984	2 211	1.3	760	1 432	19	615	164	36
COSTA RICA. Total coverage began 15 July 1957											
1st	Jul. 57-Aug. 58	287 537	24 773	1 786	7.2	115	1 661	10	703	15	5
2nd	Sep. 58-Sep. 59	303 151	52 697	2 222	4.2	135	2 081	6	470	20	5
3rd	Oct. 59-Feb. 60	247 322	25 268	670	2.7	46	623	1	827	16	6
DOMINICAN REPUBLIC. Total coverage began 16 June 1958											
1st	Jun. 58-Jun. 59	2 015 214	29 718	3 060	10.3	1 522	1 537	1	318	6	4
2nd	Jul. 59-Feb. 60	1 010 344	18 414	3 440	18.7	2 255	1 675	10	329	6	5
ECUADOR. Total coverage began 28 March 1957											
1st	Apr. 57-Mar. 58	(b) 1 777 566	47 993	2 258	4.7	1 169	1 086	3	0	14	9
2nd	Apr. 58-Mar. 59	(b) 2 171 079	69 085	4 802	7.0	2 361	2 437	4	2 429	37	9
3rd	Apr. 59-Jan. 60	(b) 1 747 672	89 492	5 269	5.9	2 152	3 113	4	2 395	43	13
EL SALVADOR. Total coverage began 1 July 1956											
1st	Jul. 56-Jul. 57	2 845 568	...	(c) 4 040	...	1 751	2 200	3	...	...	...
2nd	Aug. 57-Jul. 58	2 102 503	42 216	9 108	21.6	4 212	4 891	5	...	...	...
3rd	Aug. 58-Jul. 59	(d) ...	59 463	13 520	22.7	4 384	9 136	0	1 296	17	4
4th	Aug. 59-Feb. 60	1 257 537	45 775	10 057	22.0	2 625	7 432	0	946	17	4
GUATEMALA. Total coverage began 1 August 1956											
1st	Aug. 56-Aug. 57	...	22 965	5 116	22.3	1 255	3 858	3	...	...	12
2nd	Sep. 57-Sep. 58	1 477 675	47 945	10 084	21.0	3 909	6 174	1	128	11	10
3rd	Oct. 58-Oct. 59	1 544 144	124 519	13 034	10.5	3 734	9 300	0	1 647	30	10
4th	Nov. 59-Feb. 60	642 375	27 154	640	2.4	126	514	0	2 032	48	10
HONDURAS. Total coverage began 15 July 1959											
1st	Jul. 59-Feb. 60	967 265	52 052	5 291	10.2	2 678	2 612	1	1 293	26	11
MEXICO. Total coverage began 1 January 1957											
1st	1957	12 597 171	175 080	4 387	2.5	514	3 856	0	27 492	227	42
2nd	1958	12 501 599	403 573	3 290	0.8	487	2 779	24	30 104	291	42
3rd	1959	15 574 586	821 598	3 202	0.4	443	2 705	54	31 407	362	50
NICARAGUA. Total coverage began 10 November 1958											
1st	1959	2 352 191	38 966	1 875	4.8	619	1 256	0	1 158	33	5
2nd	Jan. - Mar. 1960	669 933	13 739	944	6.9	325	619	6	700	33	5
PANAMA. Total coverage began 19 August 1957											
1st	Aug. 57-Aug. 58	931 500	(e) 51 248	(e) 4 472	(e) 8.7	(e) 1 168	(e) 3 239	(e) 65	1 002	18	7
2nd	Sep. 58-Aug. 59	667 095	93 338	4 921	5.3	720	4 196	5	1 352	25	7
3rd	Sep. 59-Feb. 60	301 975	36 421	2 733	7.5	363	2 369	1	1 212	25	7
PARAGUAY. Total coverage began 30 October 1957											
1st	Nov. 57-Oct. 58	747 541	13 526	500	3.7	3	496	1	110	6	9
2nd	Nov. 58-Oct. 59	805 232	11 963	621	5.2	3	618	0	859	13	9

... No information.

(a) September 1959-March 1960. (b) Somewhat less than half the houses are currently sprayed with DDT on a 6-month cycle, so that these figures represent an overestimate of total persons protected over the year.
(c) Including 86 mixed infections not distributed by species. (d) Data not available because of shift from Dieldrin to DDT. (e) January-August 1958.

Table 14 (Concluded)

EVALUATION OPERATIONS OF MALARIA ERADICATION PROGRAMS IN THE AMERICAS AS OF MARCH 1960

Year of total coverage	Date	Number of inhabitants directly protected by spraying	Number of slides examined	Number of positive slides	Per cent positive	Species of plasmodia			No. of notification posts	No. of evaluators	No. of microscopists
						P. falciparum	P. vivax	P. malariae			
PERU. Total coverage began 30 October 1957											
1st (a)	Nov. 57-Oct. 58	1 867 208	...	652(b)	...	77	527	29	2 024	60	22
2nd(a)	1959	1 174 222	151 952	4 327	2.8	277	3 997	53	6 828	47	21
3rd(a)	Jan. - Mar. 1960	685 907	60 688	1 012	1.7	47	946	19	7 131	69	30
BRITISH HONDURAS. Total coverage began 4 February 1957(c)											
1st	Feb. 57-Jan. 58	46 825	2 132	256	12.0	148	56	52	...	...	...
2nd	Feb. 58-Dec. 58	158 675	4 374	288	6.6	117	147	24	44	...	2
3rd	May 59-Apr. 60	82 740	11 592	802	6.9	537	195	70	125	4	2
DOMINICA. Total coverage began 8 June 1959											
1st	June 59-Mar. 60	13 619	4 170	51	1.2	51	0	0	26	4	1
GRENADA. Total coverage began 12 February 1957											
1st	Feb. 57-Jan. 58	26 496	3 230	123	3.8	123	0	0	23	2	1
2nd	Feb. 58-Jan. 59	30 015	10 954	50	0.5	50	0	0	24	3	1
3rd	Feb. 59-Jan. 60	30 138	5 283	2	0.05	2	0	0	29	3	1
JAMAICA. Total coverage began 2 January 1958											
1st	1958	1 054 894	56 266	205	0.4	199	0	6	...	25	10
2nd	1959	1 037 284	39 726	371	0.9	352	0	19	162	31	10
ST. LUCIA. Total coverage began 16 January 1956											
1st	Jan. 56-Jan. 57	43 150	4 689	72	1.5	63	0	9	...	...	...
2nd	Feb. - Dec. 1957	49 352	4 288	19	0.4	15	0	4	...	...	...
3rd	Jan. 58-Jan. 59	57 508	8 378	38	0.5	29	0	9	22	3	1
4th	Feb. - Sep. 1959	62 324	8 028	3	0.05	3	0	0	22	3	1
(d)	Oct. 59-Mar. 60	0	6 832	0	0.0	0	0	0	22	5	1
SURINAM. Total coverage began 4 May 1958											
1st	May 58-Apr. 59	190 951	37 292	3 547	9.5	3 356	71	120	17	12	3
2nd	May 59-Mar. 60	172 694	43 131	3 166	7.3	2 768	30	368	23	15	4
TRINIDAD AND TOBAGO. Total coverage began 2 January 1958											
1st	1958	(e) 571 963	(f) 26 501	(f) 328	(f) 1.2	(f) 277	(f) 51	(f) 0	...	...	...
2nd	1959	726 681	101 400	97	0.1	67	29	1	86	53	9
3rd	Jan. - Apr. 1960	372 729	12 981	10	0.1	8	2	0	86	71	10

... No information.

(a) Coastal region only 1957-58; data for 1959-60 do not coincide precisely with year of coverage, since information by year of coverage is not yet available for the whole country. (b) Including 19 mixed infections not differentiated by species. (c) Shifts in the date of different years of coverage correspond to delays in starting spraying cycles and re-training of personnel. (d) Spraying suspended; surveillance phase begun October 1959. (e) January-October 1958. (f) January-September 1958.

Table 15

CASES OF MALARIA REPORTED AND CONFIRMED IN THE AMERICAS, 1956-1959

Country or other political unit	1956		1957		1958		1959	
	Reported (a)	Confirmed (b)	Reported (a)	Confirmed (b)	Reported (a)	Confirmed (b)	Reported (a)	Confirmed (b)
Argentina	707	707	791	785	1 096	1 107	4 668(c)	5 104
Bolivia	1 395	1 343	740	...	1 774	392	1 804	1 856(d)
Brazil	...	18 099	...	31 712	...	3 530(e)	...	...
Colombia	69 714	1 642	76 596	2 536	79 554	683	54 915	4 172
Costa Rica	1 379	1 205	1 699	1 153	2 544	2 162	...	1 899
Cuba	131	...	270	...	63	...	121	330(f)
Dominican Republic	1 831	904	1 533	1 533	2 676	2 676	...	374(g)
Ecuador	...	...	1 655	1 675	4 945	3 853(h)	5 600	5 887
El Salvador	4 575	5 802	6 661	6 655	9 351	9 351	...	17 251
Guatemala	19 768	2 397	11 066	5 653	13 224	12 829	7 894	7 894
Haiti	9 534	563	15 219	1 987	25 943	898	29 362(i)	...
Honduras	...	74	...	190	14 366	2 049	14 650	6 675
Mexico	33 360	4 233	20 333	4 387	7 092	3 261	1 289	3 203
Nicaragua	...	458	746	746	816	1 154	1 329	1 875
Panama	3 395	239	7 130	7 550	5 216	7 253	1 281	5 017
Paraguay	443	70	461	206	260	500	213	621
Peru(j)	8 241	308	8 874	639	8 409	1 043	4 760	4 390
Venezuela	1 228	1 266	782	899	816	1 138	886	897
British Guiana	42	36	4	3	114	51	174	...
British Honduras	302	72	234	212	288	231	1 014	1 019
Dominica	15	...	55	1	71	25	143	46
French Guiana	29	29	23	15	6	15	6	16
Grenada	...	160	...	134	...	52	...	2
Guadeloupe	0	...	0	1	3	3	...	0
Jamaica	3 712	397	4 239	265	2 966	139	2 420	371
Panama Canal Zone	4	...	70	109	103	71	26	26
St. Lucia	2 279	67	295	19	67	38	3	3
Surinam	447	447	288	87	...	2 244	...	2 880
Trinidad and Tobago	156	332	270	695	138	376	23	97

... No information.

(a) Reported cases are those notified to the PASB by national health or statistics services, commonly without laboratory confirmation. (b) Confirmed cases are those for which positive slides are obtained in evaluation operations of the Malaria Eradication Program. (c) Incomplete. (d) January-November 1959. (e) State of São Paulo only. (f) May 1959-March 1960. (g) Excluding August 1959. (h) April-December 1958. (i) Excluding last week of 1959. (j) 1956-1958, coastal regions only.

Table 16

COMPARATIVE RESULTS OF ACTIVE AND PASSIVE CASE FINDING IN THE AMERICAS, 1959

Country or other political unit	Active case finding					Passive case finding (notification posts)				
	Slides produced	Positive slides				Slides produced	Positive slides			
		Falci-parum	Vivax	Ma-lar-iae	Total		Falci-parum	Vivax	Ma-lar-iae	Total
Argentina (a)	...	0	531	0	531	...	0	531	0	531
Bolivia (b)	43 785	137	678	169	984	26 879	103	646	123	872
Brazil	...	...	...	...	...	...	...	...	...	...
Colombia	323 637	1 158	2 792	34	3 984	5 651	37	150	1	188
Costa Rica	31 618	675	38	2	715	20 918	83	1 100	1	1 184
Cuba	...	...	...	...	...	...	...	...	...	...
Dominican Republic (c)	9 748	442	285	0	731(d)	17 104	1 379	1 340	7	2 726
Ecuador (e)	22 707	658	403	0	1 061	58 282	1 399	2 436	3	3 838
El Salvador	8 839	339	358	0	697	62 456	3 712	13 112	0	16 824
Guatemala	11 590	232	424	0	656	96 458	1 316	5 922	0	7 328
Haiti	...	...	...	...	...	...	...	...	...	...
Honduras	-	-	-	-	-	65 115	3 114	3 451	1	6 566
Mexico	611 312	...	...	...	1 726	188 615	...	...	...	1 476
Nicaragua (f)	4 566	140	244	0	384	34 400	479	1 012	0	1 491
Panama	6 949	40	156	0	196	71 712	580	4 239	2	4 821
Paraguay (g)	3 563	0	130	0	130	8 400	3	488	0	491
Peru	44 834	...	...	...	1 012	106 142	...	...	...	3 378
Venezuela	463 750	...	...	...	778	40 027	...	...	...	119
British Guiana	...	...	...	...	...	...	...	...	...	...
British Honduras	2 851	287	28	38	353	8 456	425	183	58	666
Dominica (h)	2 572	40	0	0	40	229	6	0	0	6
French Guiana	...	...	...	...	...	...	...	...	...	...
Grenada	4 055	0	0	0	0	1 640	2	0	0	2
Guadeloupe	...	...	...	...	...	...	...	...	...	...
Jamaica	20 170	178	0	16	194	19 556	174	0	3	177
Panama Canal Zone	...	...	...	...	...	...	...	...	...	...
St. Lucia	8 523	3	0	0	3	4 745	0	0	0	0
Surinam (i)	30 430	273	1	22	296	10 824	1 493	11	255	1 759
Trinidad and Tobago	99 965	48	21	1	70	1 435	19	8	0	27

... No information.
- None.

(a) August-December 1959. (b) January-November 1959. (c) Excluding August. (d) Including four positive slides with plasmodium species unspecified. (e) April-December 1959. (f) Data on active case finding relate to January, September, October, November, and December 1959. (g) November 1958 to October 1959. (h) June-December 1959. (i) Excluding April.

Table 17

NATIONAL BUDGETS FOR MALARIA ERADICATION IN THE AMERICAS, 1958-1960
(in thousands of U.S. dollars)

Country or other political unit	Date of initiation of program	National budget 1958	National budget 1959	National commitments 1960
Argentina	Sept. 1949	309	312	327
Bolivia	Sept. 1958	450(a)	437(a)	420(a)
Brazil(b)	Jan. 1959	...	1 310	3 280
São Paulo	1 Sept. 1958	514	645	857
Colombia	8 Sept. 1958	1 472	2 410	2 940
Costa Rica	15 July 1957	238	235	272
Cuba	...	50	40(c)	...
Dominican Republic	1 July 1958	385	348	535
Ecuador	18 Mar. 1957	460	505	538
El Salvador	1 July 1956	530	523	523
Guatemala	1 Aug. 1956	480	485	485
Haiti	Sept. 1958	596(d)	(e)	220
Honduras	Jan. 1958	258	145	175
Mexico	2 Jan. 1957	4 128	5 540	6 720
Nicaragua	10 Nov. 1958	231	232	330
Panama	19 Aug. 1957	427	433	425
Paraguay	30 Oct. 1957	196	202	242
Peru	15 Nov. 1957	815	704	726
Venezuela	1950	7 788	7 000	...
British Guiana	Jan. 1947	89(f)	70(f)	87
British Honduras	4 Feb. 1957	38	46	47
Dominica	June 1959	5	8	8
French Guiana(g)	May 1948	78	90	96
Grenada	Feb. 1957	16	20	10
Guadeloupe	Nov. 1955	95	78	80
Jamaica	Jan. 1958	274	502	504
Panama Canal Zone	...	50	50	50
St. Lucia	1 July 1956	35	35	12
Surinam	2 May 1958	153	175	175
Trinidad and Tobago	Jan. 1958	291	293	338

... No information.
(a) ICA counterpart funds. (b) Excluding São Paulo State. (c) Preliminary investigation. (d) Met with PAHO assistance. (e) Program temporarily interrupted. (f) Coastal area only. (g) Reimportation in 1954, spraying recommenced.

TABLE 18

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION.	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT	TO DIELDRIN	INVESTIGATOR
					10 20 30 40 50 60 70 80 90	10 20 30 40 50 60 70 80 90	
BOLIVIA							
Beni	Mamoré	La Horquilla	10/59	triannulat	0	0	Galetovic
		San Ramón	7/59	albitarsis	0	0	Salazar
		San Joaquín	7/59	"	0	0	"
Cochabamba	Campero	Falso Corral	6/59	pseudopunc	0	0	Borda
		Achiras	6/59	"	0	0	"
	Mizque	Mizque	9/58	"	0		Borda, Pereira
Pando	Tahuamanu	S.Francisco	12/58	darlingi		0	Borda, Salazar
Santa Cruz	Chiquitos	Aguas Calientes	11/59	triannulat	0	0	Galetovic
		Puesto Nuevo	10/59	"	0	0	"
		Yacuces	11/59	brasiliens	VT	0	"
	Cordillera	Qbda. Estancia	4/59	pseudopunc	0	0	Borda
BRAZIL							
Ceará	Fortaleza	Barra do Ceará	12/59	albitarsis	0		Becerra, Rachou
Matto Grosso	Três Lagoas	Porto João André	8/59	"	0		Correa
Para	Belém	Belém	3-5/59	aquasalis	VT?	3 7	Rachou, Moura Lima
Rio Grande do N.	Ceará Mirim	Aroço	7/59	"	0		Rachou, Souza, Bezerra
		Estivas	7/59	"	0		" " "
Sergipe	Aracaju	Jabotiana	8/59	"	0	0	" " "
Sta.Catarina	Araquari	Ilha do Mel	4/59	bellator	0		Rachou, MouraL.,Netto
		" " "	3/59	cruzii	0		Ferreira
	Nova Tresto	Aguti	3/59	"	0		"
São Paulo	Bocaina	Duas Aguas	7/59	darlingi	0		Corrêa
	Pereira Barreto	Hda.São José	8/59	"	0		Ferrer, Correa
		Cananéia	1/59	cruzii	0		Rosario, Mantins, Cavalcante
COLOMBIA							
Atlantico	Campo de la Cruz	Algodonal	10/59	albimanus	0	0	Ferrer, P.N.Suarez, Pardo
Cordoba	Ciénaga de Oro	Suarez-Vereda	11/59	"	0	1 7	Ferrer,Cubillos, Gonzalez
Choco	Quibdo	Tagachi	9/58	darlingi	0	0	Ferrer, Garcés,Cubillos
	Riosucio	Riosucio	2/59	punctimac	VT?		Garcés,González,Ferrer González
Int. del Caqueta	Florencia	El Carmen	9/59	oswaldoi	0	0	Ferrer, P.E.Suarez
Int.del Meta	Pto. Lopez	Rionegro	8-12/59	albitarsis	0	3 5	Ferrer,Garcés,Cubillos
	Villavicencio	Indostán	12/59	darlingi	0	0	P.E.Suarez,Beltran
N.Santander	Cúcuta	Puerto León	11/59	nuñez-tovari	0	0	Ferrer,P.N.Suarez Pardo
Valle de Cauca	Buenaventura	Taparalito	2-3/59	neivai	0	0	Ferrer,Suarez Suarez
COSTA RICA							
Guanacaste	Carrillo	Guanislama	11/59	albimanus	0	0	Vargas
Puntarenas	Aguirre	Matapalo	6/59	punctimac	0	0	"
		"	6/59	albimanus	0		"
	Central	Aranjuez	8/58	"	0	0	"
		"	10/59	"	0	0	"
	Esparta	Caldera	11/59	"	0		"
San Jose	Puriscal	Gamalotillo	9/59	"	0	0	"
CUBA							
Oriente	Bayamo	Caureje	6-7/59	albimanus	0	3 6	Duret
		La Caridad	7/59	"	0	12	"
	Holguín	Limoncito	7/59	"	0	3 6	"
	Manzanillo	Cayo Redondo	7/59	"	0	9	"
DOMINICAN REPUBLIC							
Barahona	Barahona	El Peñon	10/59	albimanus	0	0	G.Ramalho
		La Joya	10/59			0	" "
Benefactor	San Juan	San Juan	8/59		0	0	" "
Julia Molina	Julia Molina	Julia Molina	7/59			3 4	" "
		El Pozo	9/59		0	3 5	" "
San Rafael	Elias Piña	El Llano	10/59		0	0	" "
Santiago	Valverde	Valverde Mao	8/59		0	5 8 1	" "
Trujillo	San Cristobal	Cent.Rio Haynai	10/59		0	3 4 1	" "
	Trujillo	El Algibe	9/59			12	" "
		Guachupita	10/59			8 9	" "
		Los Alcarrizos	11/59			5 8 1	" "

VT= Vigor tolerance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

TABLE 18 (continued)

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION.	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT	TO DIELDRIN	INVESTIGATOR
ECUADOR							
El Oro	Arenillas	El Jobo	7/59	albimanus	0	5 5	Cepeda
		" "	10/59	"		5 6	"
	Machala	Machala	6/59	"	0	4 3	"
		"	10/59	"	0	4 4	"
		Tendales	7/59	"	0	20	Moreno,Orellana
		"	10/59	"		15	"
	Santa Rosa	Santa Rosa	6/59	"	0	9 4	"
		" "	10/59	"		8 6	"
Esmeraldas	Esmeraldas	Acatames	3/59	"		0	Delgado
		Tachina	4/59	"		0	"
	Limones	Pichiyacu	11/59	punctimac		0	Cepeda
Guayas	Daule	Nobol	3/59	albimanus		0	Villavicencio,Pesantez
	Guayaquil	Guayaquil	5/59	"	0	0	Cepeda " "
			8/59	"	0		Lopez
		Balao Chico	8/59	"	0	4 9	Cepeda
	Naranjito	El Porvenir	4/59	"		0	Villavicencio
		San Antonio	4/59	"		10	"
		San José	4/59	"		4 5	Pesantez,Padilla
	Yaguachi	Yaguachi	3/59	"		0	Moreno,Salazar
Loja	Macara	Macara	10/59	"	0	0	Cepeda,Moreno
		Abillos	10/59	"		0	Moreno
Los Rios	Babahoyo	El Palmar	5/59	"		0	Villavicencio
	Vinces	Vinces	5/59	"	0		Orellana
	Quevedo	Calabi	9/59	punctimac		0	Cepeda
EL SALVADOR							
Ahuachapan	Jujutla	Las Delicias	10/59	albimanus	0		Parada
Cabañas	Sensutepec	Presa de 5 Nov.	11/59	"	1 1		A.C.Ramalho
La Libertad	La Libertad	La Libertad	3/59	"	5 5	8 2	Parada
		Melara	2-6/59	"	6 6	9 4	Parada,Viramontes
		"	5/59	pseudopunc	0		Viramontes
	La Unión	Olomega	1/59	albimanus	9 7	9 3	Parada
		Sirama	1-2/59	"	6 6	3 3	"
	Arce	L.Zapatitlan	7/58	"	0	2 4	"
San Miguel		Tecomatal	7/58	"	3 9	6 4	Duret,Heredia
	Chapetique	Hda.Tamera	12/59	"	5 5		A.C.Ramalho
San Salvador	Paychimalco	Hda.Sta.Lucia	9/59	"	5 1		Parada
San Vicente	San Vicente	Parras Lempa	11/59	"	5 2		"
		Sto.Domingo	2-6/59	"	6 2	9 5	Parada,Hobbs,Viramontes
	Tecoluca	Ctn/San Carlos	9/59	"	2 1		Parada
		" Las Anonas	9/59	"	5 2		"
		S.Ramon Grifalt	10/59	"	5 5		"
Santa Ana	Metapan	Metapan	12/59	"	0		A.C.Ramalho
		Tecomape	11/58	"	0	6 5	Duret,Parada
Sonsonate	Acajutla	Acajutla	7/58	"	10	6 6	Duret,Heredia
		Metalio	7/58	"	7	6 1	" "
		"	10/59	"	8		Parada
Usulutan	Jiquilisco	S.Marcos Lempa	10/59	"	8		A.C.Ramalho
	Pto.El Triunfo	Pto.El Triunfo	8/59	"	9 4		Parada
GUATEMALA							
Alta Verapaz	San Pedro Carcha	Sologuna	11/58	vestitipen	0	0	Dary
	Panzos	Panzos	11/59	"	0		Ochoa
		Fca.Sta.Mónica	11/59	albimanus	0		"
Chiquimula	Chiquimula	Fca.La Esmeralda	4/59	pseudopunc	0	9 0	Menchaca
		Fca.La Esmeralda	6/59	albimanus	0	5 2	Ochoa,Menchaca
El Progreso	Sanarate	S.Mig.Conconaste	9/59	"	5 3		Menchaca
		San Nicolas	9/59	"	6 5		Ochoa
		Sanarate	9-12/59	"	6 2	9 8	Dary,Menchaca,Perez
Escuintla	La Democracia	El Naranjo	3-7/59	"	7 4	9 3	Menchaca,Dary
		Paso Hondo	8/59	"	11		Menchaca
	La Gomera	Fca.Las Victorias	8/59	"	3 VT?		Ochoa,Menchaca
		Fca.Lourdes	8/59	"	0	5 5	" "
	San Jose	Fca.Varsovia	12/58	"	17	9 6	Dary
		" "	6/59	"	2 VT?	5 4	Dary,Ochoa,Menchaca
		" "	11/59	"	2 VT?		Ochoa
		Fca.El Modelo	10/59	"	11 VT?		Ochoa
	Tiquisate	Nva.Concepción	10/58	"	0	8 9	Dary
	"	Barra Nohualete	10/59	"	0		Ochoa
		El Toro	10/59	"	0		Menchaca
		Tecojate	6/59	"	3 VT?	4 6	Dary,Ochoa,Menchaca

VT = Vigor Toletance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

TABLE 18 (continued)

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION.	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT	TO DIELDRIN	INVESTIGATOR
					10 20 30 40 50 60 70 80 90	10 20 30 40 50 60 70 80 90	
GUATEMALA							
Guatemala	Amatitlán	Fca.La Trampa	7/59	albimanus	1 VT?	4 6	Dary
Izabal	El Estor	El Estor	10/59	"	0		Ochoa
	Los Amates	Quiriguá	11/59	"	0		Menchaca
	Morales	Aldea R.Blanco	11/59	"	0		"
	Puerto Barrios	El Derrumbe	11/59	"	3 VT?		"
Jutiapa	El Progreso	Laguna Retana	12/59	"	0		Ochoa
	Moyuta	Garita Chapina	10/59	"	0		"
		S.José Obraje	10/59	"	0		"
Retalhuleu	Caballo Blanco	Tomatales	7/59	"	0		Menchaca
	Champerico	Caballo Blanco	11/59	"	6 VT?		Ochoa
		Rosario	11/59	"	0		"
San Marcos	Ayutla	Aldea Los Limones	12/59	"	1 VT?		"
Santa Rosa	Guazacapán	El Papaturro	11/59	"	0		Ochoa,Pérez
	Taxisco	La Avellana	11/59	"	0		Ochoa
		Recuerdo	11/59	"	0		"
Suchitepequez	Cuyotenango	La Máquina	7/59	"	2 VT?	5 5	"
	Sto.Domingo	Nueva Venecia	11/59	"	2 VT?		"
Zacapa	Zacapa	Loma del Chile	11/59	"	0		Menchaca
		Barranca Seca	11/58	"	0	7 8	Dary
		Barranca Colorado	11/58	"	0	7 8	"
HAITI							
	Anse a Veau	Anse a Veau	12/59	albimanus		3	Solis
	Petit Goave	Petit Goave	12/59	"		2	"
	Ouanaminthe	Pitobert	3/60	"		70	"
HONDURAS							
Choluteca	Tegucigalpa	Namasague	11/58	albimanus	0	9	Austin
Comayagua	La Isla	La Isla	2/59	"	0	5 6	Austin,Turcios
	Villa S.Antonio	Las Flores	10/59	"	65	8	Turcios,Arizmendi
Cortes	Sta.Cruz de Joyoa	Villa Margarita	1/59	"	0	8	Austin,Turcios
Fco.Morazán	Cedros	Tablón	1/59	"	0	9	" "
		Jalteva	4/59	"	0	9	Turcios
MEXICO							
Chiapas	Pichucalco	Est.Suspiro	12/58	albimanus	0	0	de la Rosa
	Tonalá	Pueblo Nuevo	11/58	"	0		" " "
		Coquimatlán	9/59	"	0	0	Alvarado
Colima	Coquimatlán	Coquimatlán	7/59	pseudopunc	0	4 0	Nava
		Jala		"			"
	Manzanillo	Campos	8/59	albimanus	0	0	Nava,Fuentes
		Potrero Grande	9/58	"	0	0	Nava
Guerrero	Acapulco	Acapulco	9/58	"		0	-
		"	9/58	pseudopunc	0	0	-
		El Podrido	2/59	albimanus	0	0	-
	Chilpancingo	El Ocotito	6/59	"	0		Rosas
	Coyuca de B	Carrizal	6/59	"	0	0	Rosas,Gatica
		El Zapote	5/59	"	0	0	Alvarado,Rosas
		Las Tranquitas	6/59	"	0	0	Alvarado,Rosas,Gatica
Hidalgo	Huasca	Zupitlán	6/59	aztecus	0	0	Alvarado
Jalisco	Mixquitic	Mixquitic	7/59	albimanus	0	4 0	-
	Puerto Vallarta	El Pitillal	11/58	"	0	0	Nava,Bernal
		Ixtapa	11/58	"	0	0	Bernal, Nava
		"	11/58	pseudopunc	0		" "
	Casimiro C.	La Arada	9/59	albimanus	0	0	Nava
	Guadalajara	Guadalajara	10/59	pseudopunc	0	0	Nava,Alvarado
	Tonalá	La Esperanza	7/59	"	0	0	Nava
Mexico	Tejupilco	Rincon de Aguirre	9/59	pseudopunc	0	9	Hernández
Michoacán	Apatzingán	Las Cuevas	9/58	albimanus	0	0	Alvarado
		S.Antonio de Labor	9/59	pseudopunc	0	4	"
		" " " "	4/59	albimanus	0	6	Rosas,Alvarado
	Lombardía	La Laguna	4/59	pseudopunc		5	Rosas
		" "	5/59	albimanus	0	0	Rosas
	Paracuaro	Antunez	4/59	pseudopunc	0	9	"
		Col.Morelos	5/59	"	0		-
		Uspero	9/58	"	0	9	-
		"	9/59	"	0	7	-
	Zaragoza	2 localities	4/59	"	0	0	Rosas
Morelos	Ayala	Coahuixtla	8/59	"	0	8	de la Rosa
	Cuautla	Cuautla	8/58	"	0	9	Alvarado

VT = Vigor Toletance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

TABLE 18 (continued)

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION.	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT	TO DIELDRIN	INVESTIGATOR
MEXICO Cont'd							
Morelos Cont'd	Cuautla	Santa Ines	8/59	pseudopunc	0	96	de la Rosa
	Puente de Ixtla	Puente de Ixtla	8/59	"	0	60	de la Rosa
	Temixco	Acatlipa	7/58	"	0		Alvarado,de la Rosa
		Cerro de los Coyotes	9/58	"	0	15	-
		Temixco	7/58	"	0	92	-
	Tepalcingo	Atotonilco	8/59	"	0	35	de la Rosa
	Tlaquiltenango	Tlaquiltenango	8/59	"	0	55	de la Rosa
Nayarit	El Nyar	Agua Caliente	5/59	"	0	0	Nava
	Huajicon	Huamucilar	5/59	"		8	"
		Quiviquinta	5/59	"		0	"
	Tepic	Tepic	8/58	"	0		Alvarado
	San Blas	San Blas	12/58	albimanus	0	0	Bernal,Nava
	Santiago	2 localites	12/58	"	0		Hernández,Bernal
Oaxaca	Cuilapan	Cuilapan	10/59	pseudopun c	0		Alvarado
	Tlacolula	Totolapan	5/59	"	0		Alvarado
Puebla	Izúcar de Matamoros	2 localities	9/58	"	0	0	
		3 localities	10/59	"	0	8	Alvarado,de la Rosa
	Tilapa	2 localities	10/59	"	0	55	Alvarado,de la Rosa
Quintana Roo	Chetumal	2 localities	9/59	albimanus	0	0	Rosas,Erosas
San Luis Potosi	Tamuín	Loma Alta	10/58	pseudopunc	0	0	Beñuelos,Capetillo
Sinaloa	El Fuerte	San Blas	11/58	"	0		Castillo,Ledesma
	Mazatlan	Venadillo	12/58	albimanus	0		Castillo
	Rosario	Rosario	11/58	pseudopunc	0		"
Sonora	Bacum	2 localities	7/59	"	0	0	Bayliss G.
	Cajeme	2 "	8/59	"	0	0	"
	Hermosillo	Hermosillo	7/59	"	0	0	Bayliss,Alvarado
		San Miguel de Horcasitas	10/59	"	0	0	Alvarado
	Huatabampo	El Júpare	8/59	"	0	0	Bayliss G.
Tabasco	Huimang	Tierra Nueva	12/58	albimanus	0	0	de la Rosa
	Centro	Villa Hermosa	10/59	"	0	0	Alvarado
Tamaulipas	Altamira	Altamira	10/59	"	0		Capetillo
		2 localities	10/59	quadrimac	0	0	Capetillo,Alvarado
	Ciudad Mante	Ciudad Mante	12/58	albimanus	0	0	Beñuelos,Capetillo
	San Fernando	El Siete	8/59	quadrimac	26 VT?	92	Hernández
		Jacalitos	8/59	"	24 VT?	75	"
		La Negra	7/59	"	84	45	"
		" "		pseudopunc	0	VT?	"
	Tampico	Tampico	5/59	quadrimac	0	0	Alvarado
Veracruz	Actopan	La Luz	5/59	albimanus	0	0	Guillén
		3 localities	7/59	pseudopunc	0	0	Alvarado,Guillén
	Alvarado	2 localities	7/59	albimanus	0	0	Alvarado
	Cosoleacaque	San Pedrito	10/59	"	0		Alvarado
	Guiterrez Zam.	2 localities	3/59	"	0	0	Alvarado
	La Antigua	Salmoral	5/59	"	0		Guillén
		"	5/59	pseudopunc	0		"
	Papantla	Papantla	3/59	albimanus	0	0	Alvarado
		El Cedro	10/58	pseudopunc	0		Alvarado,Guillén
	Paso de Ovejas	El Mango	5/59	albimanus	0		Guillén
		" "	4/59	pseudopunc	0		"
	Pueblo Viejo	Col.Anahuac	10/59	albimanus	0	0	Alvarado
	Salta Barranca	Salta Barranca	11/58	"	0		Alvarado,Guillén
	Tlacotalpan	Tlacotalpan	8/59	"	0		Alvarado
	Tlalixcoyan	5 localities	10/59	pseudopunc	0	0	Guillén,Alvarado
		3 localities	11/59	albimanus	0	0	Guillén
	Tuxpan	Tuxpan	4/59	"	0		Alvarado
		Mata	3/59	quadrimac	0	VT	"
	Veracruz	2 localities	8/59	albimanus	0	0	Alvarado,Guillén,Rosas
Note:	A few of the Mexico resistant results are based on extended exposures only. All susceptible results are by WHO standard exposure.						
NICARAGUA							
Carazo	Diriamba	El Huiste	11/59	albimanus	98	92	Ruiz
Chinandega	Chichigalpa	Jordan	6/59	"	56	55	Vindel
		Palogrande	10/59	"	66		Ruiz
		Paso Hondo	9/59	"	46	68	Vindel,Ruiz
		San Ramon	10/58	"	56	69	Hereda,Austin,Dominguez
	Chinandega	Maria Elena	7/59	"	24		Ruiz
	Morazan	Campusano	9/59	"	17	58	"

VT = Vigor Tolerance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

TABLE 18 (continued)

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION.	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT	TO DIELDRIN	INVESTIGATOR
					10 20 30 40 50 60 70 80 90	10 20 30 40 50 60 70 80 90	
NICARAGUA							
Chontales	Juigalpa	Hato Grande	10/58	albimanus	0	15	Austin, Dominguez
		Puerto Diaz	12/59	"	0	4	Vindel
Granada	Granada	El Guayavo	10/59	"	4		Vindel
		Santa Cruz	11/59	"	1	16	Vindel
	Nandaime	Mecatepe	10/59	"	0	8	Vindel
		Noa Noa	10/59	"	3	6	Vindel
Leon	Leon	El Carmen	6-9/59	"			Dominguez, Ruiz
		El Tempate	4-9/59	"			Vindel, Ruiz
		El Trapiche	6/59	"			Vindel
		La Gallina	6/59	"			Dominguez
		Ojo de Agua	6/59	"			Ruiz
		Patastule	6/59	"			Vindel
		Poneloyas	6/59	"			Ruiz
		Quesada	7/59	"			Vindel
		San Geronimo	7/59	"			Vindel
		San Silvestre	6-9/59	"			Vindel, Ruiz
	Malpaisillo	Mina Leon	12/59	"			Ruiz
	Paz Centro	El Tamarindo	9/59	"			Ruiz
		" "	5/59	pseudopun	12		Ruiz
	Quelzalque	Cuercuera	6/59	albimanus			Vindel
		El Polvón	6 /59	"			Vindel
Managua	El Carmen	Apante	10/59	"			Dominguez
	Managua	La Perla	10/58	"			Heredia, Dominguez
		Las Martines	10/58	"			Heredia, Dominguez
		Los Tercios	10/58	"			Heredia, Dominguez
		Santa Clara	11/59	"			Dominguez
Managua	S.Fco.Carnicero	San Antonio	11/59	"			Dominguez
		San Roque	11/59	"			Dominguez
	Tipitapa	El Rodeo	3/59	"			Vindel
		El Zapote	3/59	"			Ruiz, Dominguez
		Melero Alto	12/59	"	0		Dominguez
		Montelimar	3/59	"			Vindel
		Panama	?/59	"			Vindel
		San Juan	5/59	"	3		Vindel
Masaya	Tisma	Playas de Tisma	7/59	"			Vindel
Nueva Segovia	Jalopa	Tastali	10/58	"	0	10	Heredia, Dominguez
Rio San Juan	San Carlos	Mancarron	9/59	"	0		Vindel
		S.Francisco	9/59	"	0		Vindel
Rivas	Belén	Casa Blanca	10/59	"	0	9	Ruiz
	Potosí	San Rafael	4/59	"	0	0	Ruiz
PANAMA							
Chiriqui	Baru	Carroche Arriba	7/59	albimanus	0	0	Conte
		Corotú	9/59	"		0	"
Colón	Chagres	Palmas Bellas	11/58	apicimacula		0	"
		Salud	11/59	punctimac	0	0	"
	Colón	Rio Alejandro	6/59	albimanus		0	"
		" "	6/59	aquasalis		0	"
		Vinotinto	11/59	punctimac		0	"
		"	11/59	albimanus		0	"
Coclé	Aguadulce	El Gallo	11/58	"	0	0	"
	Antón	Boca Rio Hato	9/59	"		0	"
Herrera		Las Plantas	6/59	"		0	"
Panamá	Chamé	Santa Cruz	11/59	"		0	"
		" "	11/59	neomaculip		0	"
		" "	11/59	punctimac		0	"
	La Chorrera	La Arenosa	12/59	triannulat		0	"
		Lagaterita	11/59	aquasalis		0	"
		Puerto Caimito	7/59	albimanus	0		"
	Panamá	Hip.Remón	10/59	"		0	"
		Tocumen	12/58	neomaculip		0	"
		"	12/58	punctimac		0	"
		"	12/58	triannulat	0	0	"

VT = Vigor Tolerance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

TABLE 18 (continued)

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT	PERCENTAGE OF RESISTANCE (*) TO DIELDRIN	INVESTIGATOR
					10 20 30 40 50 60 70 80 90	10 20 30 40 50 60 70 80 90	
PARAGUAY							
Boquerón		Puerto Pinasco	12/58	albitarsis		0	Pereira
Caaguazú	Col.Oviedo	Moreira	9/59	strodei		0	Portillo,González
	Obraje S.José	Obraje S.José	9/59	albitarsis		0	Gamarra
Concepción	Concepción	Cerro Lorito	12/58	"		0	Pereira
Cordilleras	Ens.Ayala	Cerro Porteño	9/59	strodei		0	Portillo,González
Fuerte Olimpo	Bahia Negra	Bahia Negra	11/59	triannulat	0	0	González
Misiones	Villa Florida	Villa Florida	10/59	albitarsis		0	"
Paraguari	La Colmena	La Colmena	10/59	strodei	0	0	Portillo
Sma.Trinidad	Central	Central	8/59	albitarsis		0	Gamarra
PERU							
Arequipa		Characta	6/58	pseudopunc	0	11	Acosta
	Caraveli	El Puente	4/58	"		8	"
	Ocoña	Pueblo Viejo	5/59	"		0	Villanueva
Ayacucho		Ninabamba	11/58	"		51	Acosta
Bambamarca	Niepos	2 localities	11/59	"	0	0	Napán
Cerro de Pasco		Sogorno	7/58	"	0		Acosta
Chiclayo	Chongoyape	2 localities	12/59	"	0	0	Napán
	Oyotún	2 localities	11/59	"	0	0	"
Ica		Fundo Pacaynio	5/58	"		12 VT?	Acosta
		" Arpicho	5/58	"		0	"
		Hda.Huamani	5/58	"		51	"
		S.José de los Molinos	5/58	"		19	"
Junin		La Merced	11/58	"		8 VT?	"
		Pampa del Carmen	7/58	"		8 VT?	"
La Libertad		Cerro Prieto	12/57	"	0		"
Lambayeque		Corral de Hoyo	1/58	"		8 VT?	"
Lima	Chorillos	Santa Rosa	12/59	"	0	3 VT?	Villanueva
		Villa	1-12/59	"	0	8 VT?	Napán
	Lima	Vitarte	4/58	"		26	Acosta
Loreto	Alto Amazonas	Barranca	6/59	benarrochi	0	0	Acosta
	Yavarí	Amelia	4/59	darlingi	0	0	"
Luzuriaga	Piscobamba	Shocosh	9/59	pseudopunc	0	0	Cruz
Moropon	Salitral	2 localities	10/59	"	0		Napán
San Martín		Juanjui	8/58	"	10VT?		Acosta
Tacna	Sama	El Golpe	3/59	"	0		Napán
Tarma	San Ramón	Chunchuyacu	6/59	rangeli	0	0	Villanueva
Tumbes	Tumbes	Corrales	3/59	albimanus	0	0	Acosta
	Zarumilla	Pocitos	3/59	"	0	0	"
		La Palma	8/59	"	0	5 VT?	Napán
		Totora	8/59	pseudopunc	0	0	"
VENEZUELA							
Anzoategui	El Carmen	El Eneal	11/59	aquasalis	0	0	Blázquez
Amacuro		Barimas	2/59	"	0	0	"
Aragua	Mun. Paez	La Cabrera	10/59	albimanus	0	0	"
Cojedes	San Carlos	San Carlos	10/59	albitarsis	0	9	Blázquez,Duret
Guarico	Camaguan	Camaguan	11/59	"	0	6	" "
Merida	Zarpe	Caño Blanco	11/59	apicimacula	0	0	" "
Portuguesa	Acarigua	Hda.Palo Gordo	12/59	albitarsis	0	83	" "
		" " "	12/59	triannulat	0	94	" "
Sucre	Irapa	Rio Chiquito	8/59	aquasalis	3 VT?	0	Blázquez
		" "	8/59	strodei	12 VT?	91	"
	S.J.Galdonas	S.J.Galdonas	9/59	aquasalis	0	56	"
		" " "	9/59	strodei	0	62	"
	Yaguaraparo	Yaguaraparo	8/59	aquasalis	0	33	"
		"	8/59	strodei	0	44	"
Táchira	García de Hevia	El Palmar	8/59	nuñez tovari	0	0	"
Zulia		Goajira	8/58	aquasalis	0	0	"

VT = Vigor Tolerance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

TABLE 18 (concluded)

DEGREE OF RESISTANCE TO INSECTICIDES OF AMERICAN ADULT ANOPHELES MOSQUITOES TESTED BY WHO TECHNIQUE, BY LOCALITY, TO DEC. 31, 1959

STATE, DEPARTMENT OR PROVINCE	MUNICIPALITY, DISTRICT OR COUNTY	LOCALITY	DATE LATEST INFORMATION.	SPECIES	PERCENTAGE OF RESISTANCE (*) TO DDT.	PERCENTAGE OF RESISTANCE (*) TO DIELDRIN	INVESTIGATOR
					10 20 30 40 50 60 70 80 90	10 20 30 40 50 60 70 80 90	
BRITISH HONDURAS							
Belice	Belice	Belice	2/59	albimanus	0	41	Heredia
		"	10 - 12/59	"	0		Gallego
Corozal	Corozal	Chan Chen	9/59	"	0		"
		Santa Elena	9/59	"	0		"
Punta Gorda	Punta Gorda	Cattle Landing	5/59	"	0	16	Heredia
Stann Creek	Stann Creek	Stann Creek	8/59	"	0		Gallego
FRENCH GUIANA							
		Cayenne	2/58	aquasalis	0	0	Fauray
JAMAICA							
(Parish)							
Clarendon		Salt River	1/59	albimanus	0	3	Van Seventer
Hanover		Logwood	12/58	"		4	" "
Manchester		Alligator Pond	1/59	"		0	Aarons
Portland		Orange Bay	1/59	"		7	"
St.Andrews		Ferry Kingston	11/58	"	0		Van Seventer
St. Catherine		Amity Hall	2/59	"		16	" "
St.Elizabeth		Pedro Bay	11/58	"		0	" "
St.James		Success Pond	12/58	"		96	Aarons
St.Mary		Dover	1/59	"		4	"
Westmoreland		Big Bridge	11/58	"		0	Van Seventer
		Frome	12/58	"		0	" "
SURINAM							
Surinaame	Paramaribo	Paramaribo	5/59	aquasalis	0	0	Van Seventer
TRINIDAD							
		Cedros	7/59	aquasalis	0	26	Omardeen
		Fishing Pond	7/59	"	0	7	"
		Moruga	3/59	"		96	Van Seventer
		New Lapaille	3/59	"	0		Omardeen

VT = Vigor Tolerance VT? = possible vigor tolerance, insufficient evidence.
(*).- The numbers in the resistance columns indicate the percentage of resistant individuals found.

Table 19

SUMMARY OF RESISTANCE TO INSECTICIDES OF AMERICAN ANOPHELINES TO 31 DECEMBER 1959
BY COUNTRY AND MAJOR ADMINISTRATIVE SUBDIVISION

Country or other political unit	Number of major administrative subdivisions in malarious area		Resistance found--species, insecticide (number of major administrative subdivisions given in parentheses)
	Total	Number tested	
Bolivia	8	4	no resistance found
Brazil	25	7	aquasalis, Dieldrin (1)
Colombia	17	5	albimanus, Dieldrin (1); albitarsis, Dieldrin (1)
Costa Rica	7	3	no resistance found
Cuba	3	1	albimanus, Dieldrin (1)
Dominican Republic	23	6	albimanus, Dieldrin (3)
Ecuador	17	5	albimanus, Dieldrin (2)
El Salvador	14	9	albimanus, DDT and Dieldrin (7)
Guatemala	20	12	albimanus, DDT (2); Dieldrin (5)
Haiti	5	1	albimanus, Dieldrin (1), confirmed 1960
Honduras	17	4	albimanus, DDT (1); Dieldrin (4)
Mexico	28	16	albimanus, Dieldrin (1); pseudopunctipennis, Dieldrin (5); quadrimaculatus, DDT and Dieldrin (1)
Nicaragua	17	9	albimanus, DDT (5); Dieldrin (6); pseudopunctipennis, DDT (1) and Dieldrin (1)
Panama	10	5	no resistance found
Paraguay	11	6	no resistance found
Peru	23	15	pseudopunctipennis, Dieldrin (3)
Venezuela(a)	23	7	albitarsis, Dieldrin (3); aquasalis, Dieldrin (1); strodei, Dieldrin (1); triannulatus, Dieldrin (1)
British Honduras	6	4	albimanus, Dieldrin (2)
French Guiana	1	1	no resistance found
Jamaica	12	10	albimanus, Dieldrin (6)
Surinam	7	1	no resistance found
Trinidad and Tobago	2	2	aquasalis, Dieldrin (2)

Note: information based on original protocols of insecticide resistance tests transmitted to PAHO by Malaria Eradication Services and PAHO entomologists.

(a) The vector status of A. strodei and A. triannulatus is undetermined.

Table 20

SUMMARY OF RESISTANCE TO INSECTICIDES OF AMERICAN ANOPHELINES TO 31 DECEMBER 1959 BY SPECIES OF MOSQUITO

Species of mosquito	Number of countries where DDT resistance has been found(a)	Number of countries where Dieldrin resistance has been found(b)
A. albimanus	4	12
A. albitarsis	-	2
A. aquasalis.....	-	3
A. pseudopunctipennis .	1	3
A. quadrimaculatus....	1	1
A. strodei(c)	-	1
A. triannulatus(c)	-	1

- None.

Note: Information based on original protocols of insecticide resistance tests transmitted to PAHO by Malaria Eradication Services and PAHO entomologists.

(a) DDT resistance has appeared to some degree in 5 countries in the Americas, always in combination with Dieldrin resistance. (b) Dieldrin resistance has appeared to some degree in one or more anopheline species in 16 countries in the Americas. (c) Vector status undetermined.

Table 21

PASB/WHO FULL TIME PROFESSIONAL AND TECHNICAL STAFF ASSIGNED TO COUNTRY, INTER-COUNTRY AND INTER-ZONE MALARIA ERADICATION PROJECTS IN THE AMERICAS, 1957 TO 15 JUNE 1960

Country or other political unit	Medical officers				Sanitary engineers				Sanitary inspectors				Entomologists				Other			
	1957	1958	1959	1960	1957	1958	1959	1960	1957	1958	1959	1960	1957	1958	1959	1960	1957	1958	1959	1960
Total	14	24	25	27	8	16	19	18	3	35	52	49	2	4	5	7	3	7	14	18
Bolivia	1	1	1	1	-	1	1	1	-	3	4	4	-	-	-	-	-	-	-	-
Brazil(a)	1	1	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
São Paulo	-	-	-	-	-	1	1	1	-	2	3	3	-	-	-	-	-	-	-	-
Colombia	1	1	2	2	-	1	1	1	-	4	6	6	-	-	-	-	-	1(b)	1(b)	1(b)
Costa Rica	1	1	1	1	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-
Cuba	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dominican Republic	1	1	1	1	1	1	1	1	-	2	3	3	-	-	-	-	-	-	-	-
Ecuador	1	1	1	1	-	1	1	1	-	2	4	4	-	-	-	-	-	-	-	-
El Salvador	1	1	1	1	1	1	1	1	-	1	2	2	-	-	-	-	-	-	-	-
Guatemala	-	1	1	1	-	-	1	1	1	2	3	2	-	-	-	-	-	-	-	-
Haiti(c)	1	2	-	-	1	1	-	-	1	3	2	2	-	-	-	-	-	3(d)	2(e)	1(f)
Honduras	-	1	1	1	-	-	1	1	-	1	2	2	-	-	-	-	-	-	-	-
Mexico	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	-	-	-	1(g)
Nicaragua	1	1	1	1	-	-	1	1	-	1	2	2	-	-	-	-	-	-	-	-
Panama	1	1	1	1	-	1	1	1	-	1	2	2	-	-	-	-	-	-	-	-
Paraguay	-	1	-	1	-	1	1	1	-	1	2	2	-	-	-	-	-	-	-	-
Peru	-	1	1	1	1	1	1	1	-	3	5	5	-	-	-	-	-	-	-	-
British Honduras	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Jamaica	-	1	1	1	1	1	1	1	-	2	1	2	-	-	-	-	-	-	-	-
Surinam	-	1	-	1	-	-	-	-	-	1	2	2	-	-	-	-	-	-	-	-
Windward Islands(h)	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	1(i)
Inter-zone or inter-country projects	2	6	9	9	1	3	4	3	-	2	3	1	1	3	4	6	3	3	11(j)	14(k)

- None

(a) Excluding São Paulo State. (b) Malaria statistician. (c) Program temporarily interrupted. (d) One health educator and two administrative officers. (e) Administrative officers. (f) Entomological assistant. (g) Assistant Engineer. (h) Islands of Dominica, Grenada, and St.Lucia. (i) Health educator. (j) Three administrative officers, one laboratory technician, two parasitologists, and five entomological assistants. (k) Six administrative officers, two parasitologists, two assistant entomologists, and four entomological assistants.

Table 22

PERSONNEL TRAINED IN MALARIA ERADICATION TECHNIQUES
AT INTERNATIONAL CENTERS, 1949-59 AND 1960 (TO JUNE)

Country or other political unit	Total	Venezuela				Mexico					Jamaica										Brazil				
		1949-1959		1960		1957-1959			1960		1958-1959					1960					1958-1959			1960	
		Physicians	Sanitary engineers	Physicians	Sanitary engineers	Physicians	Sanitary engineers	Sanitary inspectors	Physicians	Sanitary engineers	Physicians	Sanitary engineers	Sanitary inspectors	Entomologists	Other	Physicians	Sanitary engineers	Sanitary inspectors	Entomologists	Other	Physicians	Sanitary engineers	Entomologists	Physicians	Sanitary engineers
Total.....	514	82	30	9	3	49	44	109	2	3	44	37	38	11	8	9	3	2	3	8	2	4	10	3	1
Argentina.....	15	2	1	-	-	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Bolivia.....	25	8	4	-	2	3	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Brazil	54	9	1	1	-	19	16	7	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chile	4	-	-	1	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia.....	54	24	5	2	-	3	2	4	2	3	-	-	-	-	-	-	-	-	-	-	1	2	2	3	1
Costa Rica.....	11	2	1	1	-	1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Cuba	9	1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Dominican Republic	5	2	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	6	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
El Salvador	13	1	-	-	-	2	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Guatemala.....	20	2	1	-	-	1	3	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Haiti	21	4	-	-	1	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honduras.....	15	-	2	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Mexico	27	14	10	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nicaragua.....	9	2	1	-	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panama	12	1	-	-	-	1	1	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay.....	13	2	-	1	-	2	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Peru	29	3	2	-	-	6	6	8	-	-	1	-	1	-	-	-	-	-	-	-	-	-	2	-	-
Puerto Rico	14	-	1	-	-	-	-	1	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-
U.S.A.	21	-	-	-	-	2	1	-	-	-	-	7(a)	9	-	1	-	-	-	-	1	-	-	-	-	-
Uruguay.....	3	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela.....	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
British Honduras.	5	-	-	-	-	-	-	3	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Other W.H.O. regions	129	-	-	-	-	1	-	-	-	-	42(b)	30(c)	14(d)	11(e)	7(f)	9(g)	3(h)	2(i)	3(j)	7(j)	-	-	-	-	-

Note: National personnel of Venezuela, Mexico, Jamaica, and Brazil trained in their own country are excluded.

- None.

(a) Five sponsored by ICA. (b) Seventeen sponsored by WHO and 10 by ICA. (c) Thirteen sponsored by WHO and 14 by ICA. (d) Three sponsored by WHO and 11 by ICA. (e) Seven sponsored by WHO and four by ICA. (f) Three sponsored by WHO and four by ICA. (g) Eight sponsored by WHO and one by ICA. (h) One sponsored by WHO and two by ICA. (i) One sponsored by WHO and one by ICA. (j) Sponsored by ICA.

Table 23

FELLOWSHIPS FOR STUDY TRAVEL IN MALARIA ERADICATION, 1957 TO 15 AUGUST 1960

Country or other political unit	Total	Physicians				Engineers(a)	Entomologists(a)			Other(a)		
		1957	1958	1959	1960	1957	1957	1958	1959	1958	1959	1960
Total	75	9	20	3	6	10	6	4	2	9	4	2
Brazil	17	-	9	2	2	-	-	3	1	-	-	-
Colombia	4	1	1	-	-	1	-	1	-	-	-	-
Costa Rica	2	-	1	-	-	1	-	-	-	-	-	-
Cuba	1	-	-	1	-	-	-	-	-	-	-	-
Dominican Republic	1	1	-	-	-	-	-	-	-	-	-	-
Ecuador	1	-	-	-	1	-	-	-	-	-	-	-
El Salvador	1	-	-	-	-	1	-	-	-	-	-	-
Guatemala	2	-	-	-	-	-	2	-	-	-	-	-
Haiti	6	-	2	-	1	-	-	-	-	2(b)	-	1(c)
Honduras	4	1	-	-	-	1	1	-	-	1(d)	-	-
Mexico	9	1	3	-	1	2	1	-	1	-	-	-
Nicaragua	2	1	-	-	-	1	-	-	-	-	-	-
Panama	1	-	-	-	-	1	-	-	-	-	-	-
Paraguay	2	-	-	-	-	1	-	-	-	1(e)	-	-
Peru	3	-	-	-	-	1	2	-	-	-	-	-
Venezuela	4	-	3	-	1	-	-	-	-	-	-	-
British Guiana	4	-	-	-	-	-	-	-	-	-	4(f)	-
Dominica	2	-	-	-	-	-	-	-	-	1(b)	-	1(b)
Grenada	1	-	-	-	-	-	-	-	-	1(b)	-	-
Guadeloupe	1	-	1	-	-	-	-	-	-	-	-	-
Jamaica	2	2	-	-	-	-	-	-	-	-	-	-
Surinam	3	1	-	-	-	-	-	-	-	2(g)	-	-
Trinidad and Tobago	2	1	-	-	-	-	-	-	-	1(b)	-	-

- None

(a) In the years not shown, no fellowships were awarded. (b) Laboratory technicians. (c) Statistician. (d) Chemist. (e) Accountant. (f) Three laboratory technicians and one pharmacist. (g) One sanitary inspector and one laboratory technician.

Table 24

DRUGS PROVIDED FOR MALARIA ERADICATION PROGRAMS IN THE AMERICAS BY PAHO, 1958-1960
(000 tablets)

Country or other political unit	1958-1959				1960 (to 15 June)				1958 to 1960 (15 June)			
	Chloroquine 150 mg.	Primaquine		Pyrimethamine 25 mg.	Chloroquine 150 mg.	Primaquine		Pyrimethamine 25 mg.	Chloroquine 150 mg.	Primaquine		Pyrimethamine 25 mg.
		15 mg.	5 mg.			15 mg.	5 mg.			15 mg.	5 mg.	
Total.....	54 825	1 964	1 534	2 841	7 893	860	163	1 033	62 718	2 824	1 697	3 874
Argentina	1 144	20	-	97	-	15	15	200	1 144	35	15	297
Bolivia.....	1 270	25	20	76	349	-	-	-	1 619	25	20	76
Brazil(a).....	18 853	270.5	130	-	-	-	-	-	18 853	270.5	130	-
São Paulo	2 143	37.5	-	184	-	-	-	-	2 143	37.5	-	184
Colombia.....	7 837	137.5	-	664	-	-	-	-	7 837	137.5	-	664
Costa Rica.....	589	9	6	28	-	2	-	70	589	11	6	98
Cuba.....	50	-	-	-	-	-	-	-	50	-	-	-
Dominican Republic	2 234	39	164	10	-	-	-	-	2 234	39	164	10
Ecuador.....	2 129	48.5	20	140	-	100	100	-	2 129	148.5	120	140
El Salvador.....	1 520	76.5	50	128	-	-	-	-	1 520	76.5	50	128
Guatemala.....	1 088	34	30	92	1 400	248	-	-	2 488	282	30	92
Haiti.....	3 277	57.5	-	280	-	-	-	-	3 277	57.5	-	280
Honduras.....	1 026	21	6	88	-	10	8	-	1 026	31	14	88
Mexico.....	3 000	42	70	300	4 500	35	35	100	7 500	77	105	400
Nicaragua	827	17.5	6	72	-	-	-	-	827	17.5	6	72
Panama	1 128	32.5	20	60	200	5	-	50	1 328	37.5	20	110
Paraguay.....	560	10	-	48	-	15	5	-	560	25	5	48
Peru.....	2 302	55.5	30	196	500	15	-	-	2 802	70.5	30	196
British Guiana ...	-	-	-	55	20	1	-	115	20	1	-	170
British Honduras.	96	3	2	6	89	4	-	-	185	7	2	6
Dominica.....	50	1	-	4	-	-	-	41	50	1	-	45
Grenada.....	23	0.5	-	30	20	-	-	15	43	0.5	-	45
Guadeloupe.....	-	-	-	-	-	-	-	-	-	-	-	-
Jamaica.....	1 030	18	-	88	-	-	-	200	1 030	18	-	288
St. Lucia.....	48	1	-	60	20	-	-	10	68	1	-	70
Surinam.....	301	7	10	35	325	2	-	212	626	9	10	247
Trinidad and Tobago	2 300	1 000	970	100	470	408	-	20	2 770	1 408	970	120

- None.
(a) Excluding São Paulo State.

Table 25

EQUIPMENT AND SUPPLIES, EXCLUDING DRUGS, CONTRIBUTED BY PAHO TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1958 TO JUNE 1960

Country or other political unit	Protective equipment						Laboratory supplies						Others				
	Helmets	Bands	Visors	Gloves	Ponchos	Life-jackets	Mailing tubes	Surgi-tubes	Plastic tubes	Micro-scopes	Slides (gross)	Giemsa (grams)	Vehi-cles	Motors	DDT (lbs.)	Dieldrin (lbs.)	Kerosene (imp. gallons)
Total.....	2 558	5 784	11 360	2 444	3 050	1 029	662 000	230	420	48	24 125	3 135	18	5	38 877	7 533	210 000
Argentina.....	-	-	-	-	-	-	6 000	10	20	-	-	-	-	-	-	-	-
Bolivia	50	180	160	40	80	55	10 000	10	20	-	-	-	1(a)	-	-	-	-
Brazil.....	-	-	-	-	-	-	83 000	20	40	47	-	-	2(a)	-	-	-	-
Colombia	-	-	-	-	-	450	100 000	10	20	-	-	-	-	-	-	-	-
Costa Rica.....	-	-	-	-	-	35	500	10	20	-	-	-	-	-	-	-	-
Cuba	-	-	-	-	-	-	5 000	20	20	-	-	-	1(a)	-	-	-	-
Dominican Republic	166	332	664	166	166	-	2 000	10	20	-	-	-	-	-	-	-	-
Ecuador	206	412	824	206	206	50	50 000	10	20	-	-	-	1(a)			-	-
El Salvador(b)....	230	476	952	238	238	30	10 000	10	20	-	-	300	1(a)	-	-	-	-
Guatemala(b).....	250	500	1 000	250	255	24	25 000	10	20	-	1 340	-	1(a)	-	-	-	-
Haiti	341	682	1 364	341	341	-	-	-	-	-	-	-	2(a)	-	-	-	-
Honduras (b).....	165	330	660	165	165	10	10 000	10	20	-	70	2 835	-	-	-	-	-
Mexico	-	-	-	-	-	75	250 040	-	-	-	-	-	-	-	-	-	-
Nicaragua(b)	117	234	468	117	117	-	10 000	10	20	-	22 680	-	-	-	-	-	-
Panama.....	137	274	548	137	137	50	10 000	20	20	1	35	-	-	-	-	-	-
Paraguay	174	808	408	102	408	40	10 000	10	20	-	-	-	2(a)	-	-	-	-
Peru	618	1 236	3 672	368	668	200	75 000	10	20	-	-	-	-	1(c)	38 877	7 533	-
British Guiana ...	36	72	144	96	36	-	-	-	-	-	-	-	-	-	-	-	-
British Honduras .	38	38	76	19	19	10	900	10	20	-	-	-	1(a)	-	-	-	-
Dominica	-	-	-	-	-	-	130	-	-	-	-	-	1(d)	-	-	-	-
Grenada	-	-	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-
Jamaica	25	200	400	194	209	-	2 500	10	20	-	-	-	1(a)	-	-	-	210 000
St. Lucia	-	-	-	-	-	-	110	10	20	-	-	-	1(a) 2(d)	-	-	-	-
Surinam	5	10	20	5	5	-	550	10	20	-	-	-	1(a)	4(c)	-	-	-
Trinidad.....	-	-	-	-	-	-	1 150	10	20	-	-	-	-	-	-	-	-

- None.

(a) Station wagons. (b) Owing to the change from Dieldrin to DDT in spraying operations, the protective equipment has been transferred to other projects.

(c) Marine motors. (d) Motorcycles.

Table 26

INTERNATIONAL CONTRIBUTIONS TO MALARIA ERADICATION PROGRAMS IN THE AMERICAS, 1958-1960
(U. S. dollars)

Country or other political unit	Date of initiation of program	1958				1959				1960 (estimated)			
		PAHO/SMF	WHO/TA	UNICEF(a)	ICA(USA) (fiscal year)(b)	PAHO/SMF	WHO/TA	UNICEF(a)	ICA(USA) (fiscal year)(b)	PAHO/SMF	WHO/TA	UNICEF(a)	ICA(USA) (fiscal year)(b)
Total		942 284	221 020	5 808 400	2 962 000	1 145 709	214 589	5 666 000	4 670 000	1 358 178	109 999	3 961 000	6 275 170
Argentina	Sept. 1949	9 487	-	-	-	13 691	-	230 000	-	16 452	-	80 000	-
Bolivia	Sept. 1958	57 117	15 926	256 000	450 000(c)	59 754	11 931	143 000	437 000(c)	84 720	18 650	137 000	420 000(c)
Brazil(d)	Jan. 1959	159 829	-	-	1 490 000	110 693	-	-	2 577 000	79 212	-	-	4 000 000
São Paulo	1 Sept. 1958	20 832	-	-		39 246	-	-		75 641	-	-	
Colombia	8 Sept. 1958	60 134	17 031	1 062 000	500 000	112 960	-	755 000	366 000	124 157	-	686 000	460 000
Costa Rica	15 July 1957	19 218	-	48 000	-	27 486	-	42 000	-	31 378	-	57 000	-
Cuba		3 521	-	-	-	31 470	-	-	-	32 596	-	-	-
Dominican Republic	1 July 1958	49 994	-	108 000	-	76 920	-	103 000	-	71 897	-	109 000	-
Ecuador	18 Mar. 1957	22 613	22 973	127 000	100 000	52 411	23 494	148 000	100 000	70 721	18 025	218 000	200 000
El Salvador	1 July 1956	32 391	20 446	151 000	-	47 973	7 955	249 000	-	50 800	-	291 000	-
Guatemala	1 Aug. 1956	33 726	10 151	198 000	-	44 047	24 360	158 000	350 000	78 897	-	215 000	485 000
Haiti	Sept. 1958	223 786	18 007	170 000	75 000	151 263	1 329(e)	-	-	71 751(e)	-	-	-
Honduras	Jan. 1958	7 471	11 084	134 000	150 000	25 134	25 825	98 000	550 000	57 711	-	195 000	345 170
Mexico	2 Jan. 1957	9 934	50 991	2 625 000	-	38 887	56 619	2 420 000	-	70 742	50 284	1 005 000	-
Nicaragua	10 Nov. 1958	11 198	6 192	-	100 000	44 236	-	247 000	200 000	58 527	-	180 000	200 000
Panama	19 Aug. 1957	21 084	17 423	86 000	-	26 632	21 985	146 000	-	67 461	-	100 000	-
Paraguay	30 Oct. 1957	22 721	11 634	87 000	85 000	14 102	17 943	86 000	75 000	53 757	-	125 000	50 000
Peru	15 Nov. 1957	63 478	19 162	404 000	-	72 370	23 148	500 000	-	94 749	23 040	314 000	100 000
Venezuela	1950	1 776	-	-	-	1 291	-	-	-	-	-	-	-
British Guiana	Jan. 1957	-	-	-	-	5 043(f)	-	-	-	19 040	-	-	-
British Honduras	4 Feb. 1957	3 350	-	8 000	-	24 126	-	13 000	-	25 582	-	35 000	-
Dominica	June 1959	-	-	-	-	5 934	-	11 500	-	6 200	-	-	-
French Guiana	May 1948(g)	-	-	-	-	-	-	-	-	-	-	-	-
Grenada	Feb. 1957	9 789	-	5 000	-	5 053	-	9 500	-	6 100	-	-	-
Guadeloupe	Nov. 1955	1 226	-	-	-	-	-	-	-	-	-	-	-
Jamaica	Jan. 1958	48 926	-	204 600	12 000	52 270	-	130 000	15 000	47 952	-	178 000	15 000
Panama Canal Zone	...	-	-	-	-	-	-	-	-	-	-	-	-
St. Lucia	1 July 1956	10 328	-	6 500	-	10 711	-	2 000	-	12 284	-	-	-
Surinam	2 May 1958	36 770	-	20 300	-	33 860	-	40 500	-	41 541	-	36 000	-
Trinidad and Tobago	Jan. 1958	1 585	-	108 000	-	18 146	-	31 000	-	8 310	-	-	-

- None.
... No information.
(a) UNICEF contributions are listed under year of implementation even though allocation may have been made in a previous year. (b) ICA fiscal year does not necessarily coincide with fiscal years of the countries shown. (c) Counterpart funds. (d) Excluding São Paulo State. (e) Program temporarily interrupted. (f) Coastal area only. (g) Reimportation in 1954, spraying recommenced.