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UNITED NATIONS CHILDREN'S FUND

Programme Committee

Recommendation of the Executive Director for an Allocation

HAITI

Malaria Eradication

1. The Executive Director recommends an allocation to Haiti of \$170,000 to provide insecticides, transport and sprayers for the first year (late 1957 to late 1958) of four years of total coverage spraying in a nation-wide malaria eradication programme. Because of disturbed conditions in the country, the Government has difficulty in finding the total funds necessary for the local expenditures for the entire four years of total coverage. Government funds, complemented by bilateral assistance, will be sufficient for the first year for which the technical and administrative planning has been completed. At a later stage, after the programme has started and financing of the Government's share is assured for the entire campaign, the Board would be requested to give its approval in principle to assist in the entire four-year period of total coverage which would involve UNICEF aid totalling \$752,000, including the \$170,000 allocation recommended in this paper. For the first year of spraying the cost to the Government would be approximately \$760,000, of which \$430,000 would be from local sources, the balance from bilateral assistance; \$628,000 would be considered as matching for the UNICEF funds now requested for the year beginning late 1957.

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(12 p.)

2. In March 1955 the Executive Board approved an allocation of \$159,000 (including freight) to assist in converting Haiti's malaria control programme into an eradication campaign. In 1956 a complete survey of the malarious area was made and a comprehensive plan for eradication, including evaluation services, has been made in accordance with the standards now developed by WHO for all eradication programmes in the Americas Region.
3. Following a period of intensive training of all personnel, total coverage spraying is scheduled to commence at the end of 1957 and to continue for four years. Spraying will be carried out in the entire malarious area, 21,000 square kilometres or 76 per cent of the total area of the country. Through annual spraying with dieldrin of 771,996 houses, 3,016,277 persons will be directly protected, i.e., approximately 85 per cent of the total population.
4. Notes on the nature and extent of the malaria problem in Haiti are annexed to this document.

Evaluation of malarious area:

5. The first definition of the volume of sprayings to be carried out for eradication, as reported to the Board in March 1955 (Document E/ICEF/L.741), was based on the data available from the previous control operations. In 1956, spraying operations were practically discontinued and the resources of the Government with respect to money and manpower, were essentially devoted to the malaria reconnaissance of the country.
6. Parasite surveys conducted in 1952 showed a percentage average of 16, 32, 15 and 33 per cent respectively, in the departments of Artibonite, North, West and South. In 1956, the corresponding averages were 9, 3 and 10 and 3 per cent. Anopheline larvae have been found at elevations up to 1,200 metres, although at this height their density has been low. On the other hand, it is known that considerable movement of the population occurs within Haiti.

7. Three factors: positive spleen rate, larval findings, and internal migration have led to the establishment of a 1,000-metre contour as the limit of the endemic malaria zone in Haiti.

8. During the reconnaissance made over the period 1955/1957, all houses in this zone were numbered, and a census was taken of the population living therein. On that basis the total population to be protected has now been estimated at 3,016,277 (1957), against 1,700,000 in 1955.

#### Domiciliary sprayings to date

9. The first year's sprayings (1953) covered a very small area. An area of 2,600 square kilometres was sprayed in the second year (1954/1955), or twelve per cent of the total malarious area. In the third year (1955/1956) an area of 6,800 square kilometres was protected, or 32 per cent of the entire malarious area.

10. The population protected in 1955 was 1,006,654, the number of houses sprayed 317,806. Spraying was discontinued in 1956, with a view to reorganizing the service and completing a more accurate reconnaissance of the malarious area. The number of houses sprayed in this year was 11,692, and the population protected 38,176. Sprayings in 1956 were carried out by teams sent to various sectors for pilot operations. This preliminary experience demonstrated that the personnel should be re-trained and pointed to the need for greater decentralization in the administrative structure as well as in field operations.

#### Plan of Operations

11. The purpose of this plan is to achieve the interruption of transmission by spraying every house in the malarious area, regardless of the varying degrees of endemicity.

12. The National Service for Malaria Eradication (NSME), an integral part of the National Department of Health under the Division of Public Health, will have complete autonomy, both in the technical and administrative aspects of the programme. The National Service for Malaria Eradication is under the overall direction of a Commission for the Eradication of Malaria, including the Minister of Health as chairman, and the national health adviser as well as the WHO adviser as members.

13. The central organization of NSME, with headquarters in Port-au-Prince, is divided into three main divisions: spraying operations, evaluation; and administration. The international personnel assigned to the programme will function from the central office. The director of the central organization of NSME will be in charge of the implementation of the programme. At present this post is held by the international adviser who, in the future, is to have a Government counterpart. The administrative officer of the service is also an international staff member who is to have a Government counterpart.

14. For field operations, the country is divided into three zones, each supervised by a medical officer as Chief of Zone, and a sanitary inspector as assistant in charge of the spraying operations. Administrative personnel will also be provided for the zones. In general, the zone office will function along the same lines as the central office, with the medical officer in charge both of the overall administration of the zone and the evaluation operations; the sanitary inspector in charge of spraying operations; and with supporting administrative personnel for other required services.

15. For spraying operations, each zone will be divided into five sectors. Each sector will be further divided into four or five working areas; in each area one brigade will be assigned responsibility for spraying of all houses in that area. Dependent upon the size of the work area, brigades will comprise a chief and three or four sprayers, a total of 249 sprayers in 74 brigades.

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16. In addition, each sector will have one driver-mechanic who will be responsible for movement of personnel and materials, under the supervision of the chief of sector. A similar person will be assigned to each zone.

17. The number of houses to be sprayed, and the population to be directly protected, in each of the zones in the first year of total coverage are:

<u>Zone</u>	<u>Population</u>	<u>Houses</u>
I	863,901	248,783
II	952,018	243,867
III	1,200,358	279,346
	<u>3,016,277</u>	<u>771,996</u>

18. During the malaria reconnaissance, a representative sample of houses was measured to determine the average number of square metres of sprayable surface area per house. The average surface area was determined to be 90 square metres and calculations of insecticide requirements are based upon this figure.

#### Evaluation operations

19. Overall evaluation will be made by the international as well as by the national evaluation team as indicated above. The central organization of the Malaria Eradication Service will have an epidemiological or evaluation service in charge of the evaluation operations for the entire programme. In the field, the chiefs of zones will be responsible for the evaluation operation in the zone, which will be carried out by 60 evaluation inspectors, assigned four to each spraying sector. The number of evaluation inspectors will be increased as demands of the service require it.

20. The methods of evaluation will be those recommended by WHO, including the following:

- a) compulsory notification of cases and suspected cases of malaria;
- b) parasitological verification of all reported deaths;
- c) compulsory registration of death due to malaria;

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- d) monthly compilation of cases and verified cases of different appropriate health and other reporting agencies in the country;
- e) systematic investigation of malaria cases;
- f) epidemiological surveys for malarionometric indexes in specially selected index areas;
- g) frequent visits to hospitals, dispensaries, schools, industries, labour camps, to obtain information on fever cases, as well as house-to-house visits for that purpose;
- h) complete epidemiological investigation for every confirmed malaria case;
- i) verification of positive blood smears submitted by other agencies.

21. There will be a central parasitological laboratory which will examine all blood films coming from the field. Microscopists will be provided in the zones for prompt verification of reported cases.

#### Transport requirements

22. In each sector two pick-up trucks will be assigned for spraying operations, one for supervision and one for use of the brigades. A utility vehicle will be assigned to each sector for the use of the evaluation inspectors.

23. At the zone level, a utility vehicle will be assigned to the zone office for supervision and a pick-up truck for spraying operations. This pick-up truck will perform supporting transport services for spraying operations in all sectors of the zone.

24. A pool of four vehicles will be assigned at the headquarters level for field travel by the technical and administrative staff. Two trucks will be assigned for supply operations and, in addition, a reserve of pick-up trucks provided to substitute for field vehicles during maintenance and repair.

Health education

25. The house-to-house method of health education will be the principal method of imparting malaria eradication information in the rural areas. In urban areas, posters, leaflets, radio, press, cinemas, community assemblies, pulpit, will be used. The section of health education of the Government and that of the Inter-American Cooperative Service of the Public Health<sup>a/</sup> (SCISP) will assist in this phase of work.

Training

26. Part of the supervisory staff for the campaign was trained in Mexico in 1956. Additional training abroad will be given to three chiefs of sectors, three sanitary inspectors, one entomologist assistant, and several other auxiliary employees under the WHO training programme. Local training will be completed for other field personnel.

Vigilance period (second stage of the plan of operations)

27. At the start of the final year of spraying in any area evaluation operations will be intensified into those of vigilance. The period of vigilance and prevention of re-infection will continue for at least three years following interruption of spraying.

28. A local malaria eradication auxiliary service will be organized as a voluntary organization from the commencement of spraying by the malaria eradication team in each sector of the country. These local auxiliary services will be organized under a rotating chairmanship and will consist of the chief of sector, representatives of the church, teachers if any in the section, rural policeman in each locality and leaders of the community. Their main function will be to enhance the participation of the community in the malaria eradication programme; distribute malaria education information and information materials; and to report to the nearest malaria eradication office the location of new houses and

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a/ Service Cooperatif Interamericain de Sante Publique.

repaired houses for spraying. When these auxiliary organizations are well organized, they will also report the presence of malaria cases and take blood smears. In order to encourage these auxiliary eradication service teams, a certificate of commendation will be given to the chairman each year on Malaria Eradication Day in fitting ceremonies.

29. Epidemiological surveillance will consist of active search for fever cases by house-to-house visits. The aim is to visit every house at least once a month. Information obtained from hospitals, dispensaries and laboratories will be followed up by epidemiological investigation of such positive cases. All blood films collected shall be examined immediately and the positive results shall be transmitted to the field personnel in order that prompt action and remedial measures may be instituted.

30. Whenever the results of the epidemiological investigation of confirmed cases show a possible indigenous transmission, an emergency spraying of all the houses within a one-kilometre radius shall be immediately undertaken.

31. All fever cases confirmed to be malaria infections will be given complete treatment following WHO standards of radical treatment. At the same time, other possible or suspicious fever cases will be sought and each case given treatment with anti-malaria drugs.

UNICEF commitments

32. The allocation recommended in this paper would provide supplies for the first year of total coverage as follows:

	<u>US\$</u>
a) <u>Dieldrin</u> 50 per cent, 125,500 pounds	113,000
b) <u>Transport</u> , 13 pick-up vehicles and spares	36,650
c) <u>Sprayers</u> , 120 and spares	4,550
d) <u>Contingency</u>	<u>400</u>
Total supplies and equipment	154,600
e) <u>Freight</u>	<u>15,400</u>
Total recommended allocation	170,000

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33. Supplies and equipment provided by UNICEF against the previous allocation for this programme (E/ICEF/L.741) will be available for the total-coverage spraying period, with the exception of 13,600 pounds of dieldrin which will be used during the training period.

WHO approval and participation

34. Technical approval has been given by WHO for this project. WHO will continue the services of a malariologist who is presently director of the programme, and expects to provide in addition one sanitary engineer, four sanitary inspectors and one administrator as consultant for this programme. WHO will provide protective clothing for workers using dieldrin, laboratory equipment and drugs and transport for the international consultants and fellowships. For these purposes the WHO budget for 1958 includes \$176,297 under TA Priority I, and from the PASB Special Malaria Fund.

Government commitments and matching

35. The expenditures of the Government for the first year are estimated at the equivalent of US\$760,000, of which \$628,000 is taken as matching for the proposed UNICEF allocation. As the Government is now facing economic difficulties, they can at present only provide previously budgeted funds up to a total of \$430,000 for this period. Complementary funds to meet the balance of local expenditures are expected from PASB or from bilateral assistance.

36. The Government will, as soon as the general situation permits, approve a malaria eradication law in accordance with the standards recommended by WHO for all countries including provision for the following:

- a) compulsory notification and parasitological confirmation of all cases or suspected cases of malaria;
- b) intra-domiciliary spraying with residual insecticides;
- c) control of the sale of anti-malarial drugs;
- d) legal sanctions for failure to comply with the provisions of the law.

ANNEXThe Problem of Malaria in Haiti

Hyperendemic malaria is found in the Artibonite valley and in the South Department. Malaria is endemic throughout the islands, more endemic amongst the coastal towns, and less endemic towards the mountains and plateaus.

The following data illustrate the parasite prevalence from year to year (1950/1957):

<u>Year</u>	<u>Number Examined</u>	<u>Number Positive</u>	<u>Parasite Rate (per cent)</u>	<u>Parasite Prevalence</u>		
				<u>P.falciparum (per cent)</u>	<u>P.vivax (per cent)</u>	<u>P.malariae (per cent)</u>
1950	2,183	400	18	97	1	2
1951	2,459	413	17	81	4	15
1952	4,821	747	15	90	1	9
1953	2,885	283	9.8	82	2	16
1954	5,032	608	12	92.8	.2	7
1955	-	-	-	-	-	-
1956	6,252	563	9	82	15	3
1957	4,841	573	11.8	96	3	1

Data concerning morbidity and mortality from malaria are neither complete nor reliable. Diagnosis of malaria is made chiefly by layman and there is no uniform reporting system throughout the country. Data taken from hospitals are more accurate, but do not represent the true picture, as few people are hospitalized for malaria.

The following table will show the number of reported cases of malaria with rates per 100,000 population in the following periods:

<u>Period</u>	<u>No. of Cases</u>	<u>Approximate rate per 100,000</u>	<u>Parasite rate in per cent</u>
1934-1943	57,979	2,520.8	-
1943-1950	70,895	2,363.2	16
1950	71,954	2,336.2	-
1951	72,176	2,300.8	-
1952	90,928	2,841.5	-
1953	62,771	2,024.8	11.9
1954	77,535	2,423.0	11.4
1955	33,682	1,020.7	24.1

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In a school survey made in 1954, the spleen rate was found to be 9.6 per cent and parasite rate was 15.3 per cent.

From mortality data taken from hospital sources, which are not available for 1955 and 1956, the mortality rate was 49.3 in the period 1945/1950, and is averaging 20 per 100,000 in the period 1952/1954. Most of the vectors are A.albimanus. The transmission of the disease can be considered all year round, particularly in places such as the windward slopes, which receive continuous rain throughout the year. Malaria cases are more prevalent during the months July to December (the rainy season), and less during the dry months (February-April).