TO: Mr. Clifford Belcher/Chief, PHO/USAID/Kinshasa

INF: Dr. Robert L. Kaiser, Director
Parasitic Disease Division/CID/CDC

Mr. Robert L. Turner, Malaria Advisor/PIAP

Dr. Makengo Bigonsa, Medical Director/PIAP

FROM: Dr. John D. Sexton, Malaria Epidemiologist/Kinshasa

SUBJ: Annual Report: August, 1980 through July, 1981

My PASA calls for an annual report after the first Since I arrived on July 1o, 1980, such a report is now due.

LABORATORY ORGANIZATION

During the past year the laboratory was re-organized; an organizational chart with position responsibilities was prepared and approved; instructions for the orderly flow of work was implemented; and, a statistical section was organized to prepare the necessary reports. The laboratory is now functioning in a satisfactory manner.

LABORATORY STAFFING

All critical leadership positions were filled during the year with the employment of a Chief of Laboratory in October, a Statistician in March, and a Chief of Entomology in April. All lower staff positions were finally filled with the employment of 6 entomological aides in July, 1981. The epidemiology staff now consists of: Four Chiefs (Laboratory, Parasitiology, Microscopy and Entomology), 10 microscopists, 6 entomology aides, 15 blood smear collectors, 4 dispensary visitors, 3 drug distribution agents, 1 statistician, 2 statistical aides, 1 typist, and 1 blood smear stainer.

TRAINING

The following training was provided the laboratory staff during the year.

1. On-the-job training. Fully qualified people have been impossible to find. Therefore, all staff have received (and continue to receive) on-the-job training on a daily basis.

   The microscopists and Chief of each section were provided with 12 hours of formal training in the laboratory diagnosis of malaria by a representative of WHO. This was the second course provided by WHO in two years.

   All blood smear collectors were given a two day orientation and training course. Following this, they worked with experienced personnel for a week in the field.

   The Chief of Entomology was sent to ORSTROM/Brazzaville for a month of entomology training.

   The six entomology aides were given a one week entomology course that was designed and conducted by the staff.

6. The five chiefs of the groups for the spray operation were cross-trained to do blood smear collections.

Future training includes: (1) a six-part course on the laboratory diagnosis of malaria. The course consists of tapes and 35 mm slides provided by CDC/Atlanta. The tapes are now being translated from

program for PLAP.

EPIDEMIOLOGICAL EVALUATION

1. Rural area pilot project - Bas Zaire

A. General

The rural area of the pilot project consists of a spray area containing some 7775 people in 50 villages served by the Health Centers of Ngidinga, Malele, and Sadi Kisanga, and a control area of some 7834 people in 22 villages served by the Health Centers of Kimpemba, Kiyengo, and Masikila.

During the past year the houses in the rural spray area received two cycles of 5% DDT at 2 gm/m^2 (September, 1980 and March, 1981).

Evaluation of the affect of spraying followed three lines: (1) Malariometric surveys, (2) Blood smears collected from fever patients by the Health Center staffs, and (3) a review of dispensary records for total client visits and fever cases.

B. Results

(1). Malariometric Surveys

Three surveys have been completed during the year. Tables I & V and Figure 1 provide a summary of the results of the surveys in both the spray and control area. The slide positivity rate (SPR) went from 20.7% in July, 1980 to 7.2% in July, 1981 in the spray area, while in the control area the SPR went from 23.0% in October, 1980 to 31.0% in July, 1981. There was an overall reduction of 65.2% in the SPR after two cycles of spraying. In a population of 7775 people this means that some 1149 fewer malaria cases were present by the end of the year. It is also quite clear that a comparison of the slide positivity rates of the spray and control areas show that spraying is reducing malaria.

A summary of the smears examined for the 0 - 11 month-infants of the spray area is given on Table 2 and for the control area on Table 6. The SPR's of these infants in the spray area went from 23.9% before the first spray to 8.6% after the second spray. In contrast, the SPR for this age group in the control area went from 19.7% to 35.5% during the same period. Again a strong indication that spraying is reducing transmission in the area under DDT protection.

(2) Dispensary blood smears

PLAP began requesting the three Health Centers in the spray area to take blood smears from fever patients in September, 1980. Table 3 summarizes these data. The Ngidinga Health Center has been the most active in taking smears, but since the last quarterly report, the other two dispensaries have been visited several times to encourage them to take more smears. As a result, some improvement in May through July, 1981 can be seen. The results do show that the SPR's at the dispensaries are running much higher than the malariometric survey SPR's. This is not unusual as the dispensaries take smears from fever patients while the surveys were non-selective. In addition, the dispensary results covered all villages served by the Centers while the survey results are only for sprayed villages. PLAP is now breaking out the fever case smear data by treated or non-treated villages.

In the control area it has been only in the past few months that the three dispensaries have begun to take blood smears from fever patients. The results to date are on Table 7. The overall SPR was 40.0% The percentage of fever cases in the control area with malaria has a higher average than those with malaria in the spray area (Table 5).

(3) Dispensary client visits and fever cases

PLAP has collected data from the Health Centers on their monthly client and fever case load from the sprayed and control villages. Tables 4 & 8 summarize the January through June data for 1980 and 1981 for the sprayed and control villages, respectively. A comparison of these data show fewer client visits and fever cases in 1981 as compared to 1980 for the sprayed villages, but more client visits and little change in the percentage of fever cases from people in the control villages. PLAP will continue to follow client visits and fever cases in both areas to see if these trends continue over the next year. It would be expected that over a two year period few fever cases would be seen at the dispensaries in the sprayed area, and this in turn, would lessen the number of client visits.

(4) Comparison of slide positivity rates in the sprayed and control villages

The difference in the percentage of the SPR of the third survey in the spray area (7.2%) and the control area (30.8%) is significantly different when subjected to a formula of Swaroop, 1900.

ENTOMOLOGY

As stated earlier this section now has the personnel to carry out their work activities. Some of the results of their work follow:

1. Field captured A. gambiae adults were found to be susceptible to DDT. The WHO test kit 4% DDT papers produced a kill of 96.5% bases on 8 replicates.

2. Two DDT treated villages and two non-treated villages in Bas Zaire were checked for Anopheles. Two methods were employed to capture the adults. One method was to visit the houses at [night]* and with the use of a flashlight and aspirator tube look for the resting adults on the surfaces within the houses. The other method employed the use of white sheets placed on the floors of the houses, and then pyrethrum was sprayed throughout the house. The house was kept closed for 10 minutes; after which, the sheets were checked for dead mosquitoes. Using these methods 1 A. gambiae was recovered in the two sprayed villages while 412 A. gambiae, 14 A. funestus, 2 A. nili and 3 A. coustani were recovered in the non-treated villages.

3. In another survey recently completed in Bas Zaire, 12 villages in the sprayed area were visited and six houses in each village checked for Anopheles adult mosquitoes using the white sheet-pyrethrum spray method. In 9 of the 12 villages, [in which] 54 homes were checked, no Anopheles were recovered; in two villages, [in which] 12 houses were checked, no A. gambiae were found, but a single representative of A. hancocki and A. nili in one village, and A. hancocki and A. funustus in the other village; and in one village, [where] six houses were checked, did the team find A. gambiae. They recovered 5 A. gambiae, 9 A. funustus and 1 A. nili. These surveys indicate that the primary vector, A. gambiae, was not prevalent in sprayed houses could be recovered from non-treated houses.

URBAN AREA

As stated in earlier reports, the urban portion of the project consists of the three spray zones of Kimbanseke (part), Masina and Nujili, and the control zone of Limete. During the past year PLAP carried out malariometric surveys, school surveys, and retrieved total client and fever case data from some 115 dispensaries in all zones, and began an infant parasite survey in Limete.

*during the morning

RESULTS

1. School Surveys

The Ndjili Zone survey of June, 1979 produced a pre-spray slide positivity rate of 22.1% while the May, 1981 survey conducted after 4 cyles of spraying, gave an 8.5% SPR.

No pre-spray school survey was conducted in Masina by the project, but WHO surveyed a school in Masina in 1977 and found the SPR to be 32.0%. PLAP's school survey of June, 1981 carried out after 4 cycles of spraying produced an SPR of 11.7%.

The pre-spray survey in the Kimbanseke zone in March, 1980 resulted in an SPR of 26.5%. WHO, in 1977, surveyed one school in this zone and came up with an SPR of 31%. The Nutrition Project sampled Kimbanseke in 1978-79 and the SPR was 34.0%. Thus, these three SPRs before spraying indicate an average of 30.0%. After two cycles of DDT house spraying the May, 1981 school survey produced an SPR of 13.1%.

In the control zone of Limete the SPR of the initial survey in January, 1981 was 6.8%. This increased to 14.3% in the June, 1981 survey. This increase could be expected in an unsprayed zone based on the rainy season that prevails in the Kinshasa area.

2. Malariometric Surveys

These surveys were conducted in all zones during the past year. The surveys were designed to collect blood smears from 0 - 9 year-old children and pregnant mothers. The results of the surveys are given in Table 10. There have been two surveys in the spray zones of Ndjili and Masina and in the control zone of Limete. These surveys were spaced 4 - 5 months apart. The results indicate little change in the malaria picture between the initial surveys early in 1981 and the second surveys this summer in the spray zones (Ndjili - 6.9 and 7.1%, Masina - 9.6 and 11.4%), and an increase in Limete (11.3 to 17.0%).

In the spray zone of Kimbanseke which has only been surveyed once (June-July, 1981) the SPR was 17.1%. Although the malariometric surveys more accurately reflect the malaria situation in the spray zones, the school survey SPRs are somewhat similar.

In the control zone of Limete the April survey produced an SPR of 11.3% and in August it was 17.0%. These SPR's are slightly higher than the school surveys, but the trend of higher SPR's toward the end of the rainy season were similar.

Based on the initial slide positivity rates of 22% for Ndjili, 32% for Masina and 30% for Kimbanseke, one could have expected to find 35,800 malaria cases in the estimated 131,000 children (0 - 15 years old) in these three zones before spraying. With the latest SPR's one would expect to find 14,700 cases. I don't expect a further reduction in malaria unless there is an improvement in the number of houses sprayed in these zones. During the last spray round, the refusal rate by homeowners was 33% for Ndjili, 47% for Masina, and 35% for Kimbanseke. This is in contrast to the rural area where refusals are rare. Refusals in urban areas require considerably more health education than rural areas. PLAP currently has four of their personnel visiting schools, leaders of the Zones, Quartiers and localities and neighborhood groups to see whether the refusal rate can be slashed to 10 - 20% in the last spray round.

PLAP collected a high number of smears (48,526) from the project areas in the last year in order to provide (1) evaluation data, (2) adequate training for the blood collectors, (3) experience for the microscopists in examining smears, (4) experience in supervision for the staff, (5) for planning and organizing of work schedules, and (6) experience in seeking ways to improve each operation. During the coming year the sampling in the present pilot zones will be reduced so that sampling can begin in the planned expansion areas of Kinshasa.

3. Urban Dispensaries

Over 115 dispensaries in the 4 pilot project zones are being monitored on a monthly basis for total client visits and fever cases. Table 11 gives a summary of these visits and cases. Probably the most important statistic to date is the percentage of clients who are clinically diagnosed to have fever, and therefore, malaria. This ranges from approximately 35% in Masina, Limete and Kimbanseke to 47% in Ndjili. In theory, this percent of the clients would be treated for malaria. Thus a considerable number of people are receiving malaria medicine who may not have malaria as the rural area dispensary blood smears from fever patients show only about 30% of the fever cases have malaria. PLAP will continue to monitor these dispensaries. In addition, PLAP will select a number of the dispensaries to take blood smears from fever patients to see what the relationship is between clinically diagnosed malaria cases and confirmed malaria cases in an urban area. In contrast to the information in Bas Zaire, there is no discernible relationship between the spraying program and a reduction in the percent of fever cases seen at the dispensaries to date.

4. Infant Parasite Survey

This study began in June in the Control Zone of Limete. All babies born in Limete after February 28, 1981 that could be located through hospital and dispensary birth records were visited in June. Some 184 smears were taken from these 0 - 3 month-old infants with 1 positive found. In July, 239 smears were taken from 0 - 4 month-old infants (includes June newborns) and 3 were positive. It is not expected to see much malaria in the infants below the age of six months as they have some immunity acquired from their mothers. We should start to see an increase in those infants as they enter the second half of their first year of life. These infants will be followed until the project termination date in 1982 to determine the transmission variability in Kinshasa.

FUTURE PLANS

1. PLAP plans to expand the pilot project in both the urban and rural areas with an anti-malarial drug program. The first part of the expansion will be to develop baseline information on (1) the present use of drugs by the government and private organizations in Kinshasa and in selected rural areas, (2) the capability of the GOZ and others to provide drugs on a curative and/or preventive basis, (3) their desire to do so, and (4) whether they would be willing to work with PLAP in some form of drug program. Based on the information obtained PLAP will then develop a detailed Plan of Operations. This Plan may entirely depend on the Primary Health Care Services and volunteer health workers to carry out the program with PLAP doing the evaluation, or may directly involve PLAP in the operations.

2. The urban malariometric and school surveys will continue.

3. The infant parasite survey will continue in Limete.

4. The entomology section will expand its present activities in order to carry out the work plan developed.

5. With the assistance of two AID consultants in January, 1982 (?), a National Malaria Plan will be developed to present to the GOZ. This plan will take into consideration the present AID/W African Bureau Position on Malaria.

COMMENTS

1. As the project is due to terminate in mid-1982 the expansion of the pilot project into another operation activity (anti-malarial drugs) will be, of necessity, limited in actual operations and evaluation.

2. The development of a National Malaria Plan in early 1982 will be the first step in one of the objectives of the project. Namely, integration of a malaria control into the permanent health delivery system. Its presentation to the GOZ will require a direct response as to the willingness of the GOZ to continue with malaria activities. Whether such a plan can be presented, and if accepted, implemented before the termination of the Pilot Project in 1982 will be extremely difficult to achieve.

3. Certain supplies continue to be a problem for the laboratory. For example, methyl alcohol needed to fix the thin smears cannot be purchased in Zaire and a stateside order is now over 1 year old. Purchases have been made in Brazzaville, but this method leaves a lot to be desired. The PEV Advisor/Brazzaville has been requested to aid in obtaining a 9-month supply from that city.

JDS:m
Attachments

CC: Director, AID, Kinshasa

Project Purpose

The overall purpose is to strengthen the institutional capacity of the GOZ for monitoring and controlling communicable diseases.

Malaria Component

The establishment of a model malaria control program in the Kinshasa area and a nearby rural region.

The development of a cadre of GOZ health workers competent to deal with insect-borne diseases and environmental health and the organization of an infrastructure to support these activities.

Accomplishments

Epidemiology and Evaluation - A detailed report of these activities is attached. The accumulation of information by this group continues to assist the pilot program in the assessement of the field activities now underway. Epidemiological investigations include:

- Determination of the impact of the insecticidal application on malaria prevalence.
- Examination of dispensary and clinic records to ascertain the malaria positivity rate among those patients who have complained of fever or have exhibited fever symptoms.
- The accumulation of data on seasonal prevalence of fever or other malaria like symptoms and the analysis of this information.
- The collection of information on the presence and behavior of insect vectors of malaria.

Spraying

Urban Area (17 June - 18 July 1981)

In the Kinshasa pilot zone area, 2535 houses were treated with 75% DDT WDP, at the rate of 2 grams per square meter.

Rural area (24 August - 2 September 1981)

A total of 2498 houses were treated in the same manner as those in the Urban area.

Health Education - Three additional health education specialists have been transferred to the Project by Hygiene Service. The team of four health educators are now better enabled to work in the community. During the period of this report, approximately 6500 persons have been contacted in community meetings, church groups, groups of mothers at dispensaries and maternity centers youth groups political organizations, markets, and others.

Other Activities

Sun tan shirts and trousers, purchased from Excess Property, have been issued, as follows, to most regular employees, except laboratory workers : Trousers - 77 ; shirts 79. 65 sets were issued and reclaimed from spraymen during the urban campaign (17 June - 18 August).

* Epidemiology report attached or provided earlier by Epidemiologist.

Food For Work Participation

Program received and distributed food items to field spray and investigative workers and staff. The food received from AID/Catholic Relief Service was repackaged for issuance to the workers. The items were -

Bulgar-Soya	705 Kilograms
Powdered Milk	760 "
Cooking oil	397 Liters

Draft Plan of Action for Expansion of Malaria Activity, 0058.

The Plan, submitted in draft, on 8 July 1981, was followed by the explanation below, dated 18 August 1981-

The malaria pilot project proposes to demonstrate that malaria prevalence can be reduced, without the application of insecticides through the distribution of drugs in a well organized and implemented distribution program. The Plan would begin with the collection of essential baseline data and subsequent pilot approaches would be organized, the objective being the reduction of malaria morbidity and mortality, especially among the vulnerable young children. Program techniques developed, could be utilized in areas outside the pilot study territory.

The activities would be implemented through the primary health care system. The role of the pilot project would be that of planning for the organized distribution of anti-malarials down to village level, assistance with the implementation of the distribution program, and the evaluation of the impact of the program on reduction of the malaria parasite reservoir in the population.

Visitors

1. Mr. Serge Roche, WHO Technical Officer visited the project during May to assemble preliminary information which will be useful during the planning process for the national malaria control Plan of Action.
2. A WHO Parasitologist is expected to arrive in Kinshasa in Mid-October to provide instruction for laboratory technicians, as well as to introduce methodologies relative to the detection of drug resistance by malaria parasites.
3. Two AID Consultants, originally requested for September, will now probably arrive in January 1982. Their objective will be to assist with the preparation of a national plan of Action.

Special Information

PHO has requested certain administrative information for 1980. This information is summarized on the following page.

Preliminary administration and finance information, 1980

Total amount spent (Counterpart funds)-Zaires ~~464,987.39~~ 464,986.63		%
Salaries	183,129.63	39
Carburant	148,648.	32
All other expenses	133,209	29

DDT used in urban and rural area - 50,380 pounds @ 0.80 for 311,554 population. Total used per population unit 0.15.7# or 28.9 grams (one ounce)

Vehicles

Transportation for project activities was also a problem in 1980. Vehicles available were -

IT 2016 Chevrolet pick up. Used by Malaria Advisor until wrecked by project chauffeur in March, 1980. In Embassy garage for one year.
IT 3257 Chev PU Received in February. Used 11 months, 1980.
IT 2830 Chev PU Used 12 months, 1980.
IT 1787 Chev PU Received March, used 9 months, 1980.
IT 1792 Chev PU Received March, used 3 months by project and given to Epidemiologist upon his arrival in July
IT 1612 Chev Blazer Received March, used by Malaria Advisor.
IT 2353 Chev Med Truck Received May, used ± 90 days for spraying campaigns.

Thus, transportation available for the project amounted to 38 vehicle months of service. Advisors' vehicles are not a part of this calculation. The Program Director used his personal vehicle in the absence of a project vehicle.

Support By Zairean Government

All local costs are paid with counterpart funds.

Twenty-two regular GOZ employees have been assigned to the project. GOZ pays a total of Zaires 4,000. per month as their base salaries.

At the FONAMES Building, GOZ provides three offices, two small store-rooms, one laboratory room, and a general use room, all comprising 196 square meters of floor space. At the former Red Cross building, Avenue de la Justice, 1540 square meters is available as a warehouse, parking lot, and eventually office and laboratory rooms.

TABLE 1: SUMMARY OF MALARIOMETRIC SURVEYS CONDUCTED IN THE RURAL SPRAY AREA OF BAS ZAIRE.

Health Center	SURVEY NUMBER AND DATE: 1st Survey September-1980 Smears Examined	Smears Pos.	% Pos.	2nd Survey February-1981 Smears Examined	Smears Pos.	% Pos.	3rd Survey July-1981 Smears Examined	Smears Pos.	% Pos.
Ngidinga	488	113	23.2	475	65	13.7	581	43	7.4
Malele	529	67	12.7	728	77	10.6	783	23	2.9
Sadi-Kisanga	261	84	32.2	469	72	15.4	553	71	12.8
Totals	1278	264	20.7	1672	214	12.8	1917	137	7.2
Reliability of Sample Size*			±3%			±2%			±2%

* Barnes and Noble (1963). 95% Confidence Level. Percent in Population assumed to be not over 30% or not less than 70%.

TABLE 2: SUMMARY OF THE SMEARS EXAMINED FROM 0 - 11 MONTH-OLD INFANTS LIVING IN THE RURAL SPRAY AREA.

Health Center	SURVEY NUMBER AND DATE: 1st Survey September-1980 Smears Examined	Smears Pos.	% Pos.	2nd Survey February-1981 Smears Examined	Smears Pos.	% Pos.	3rd Survey July-1981 Smears Examined	Smears Pos.	% Pos.
Ngidinga	30	9	30.0	28	2	7.1	75	8	10.7
Malele	33	4	12.0	22		0.0	91	0	0.0
Sadi-Kisanga	25	8	32.0	35	2	5.7	55	11	20.0
Totals	88	21	23.9	85	4	4.7	221	19	8.6

FIGURE 1: A COMPARISON OF THE PERCENTAGE OF BLOOD SMEARS POSITIVE IN THREE SURVEYS IN BOTH THE RURAL SPRAY AND CONTROL AREAS

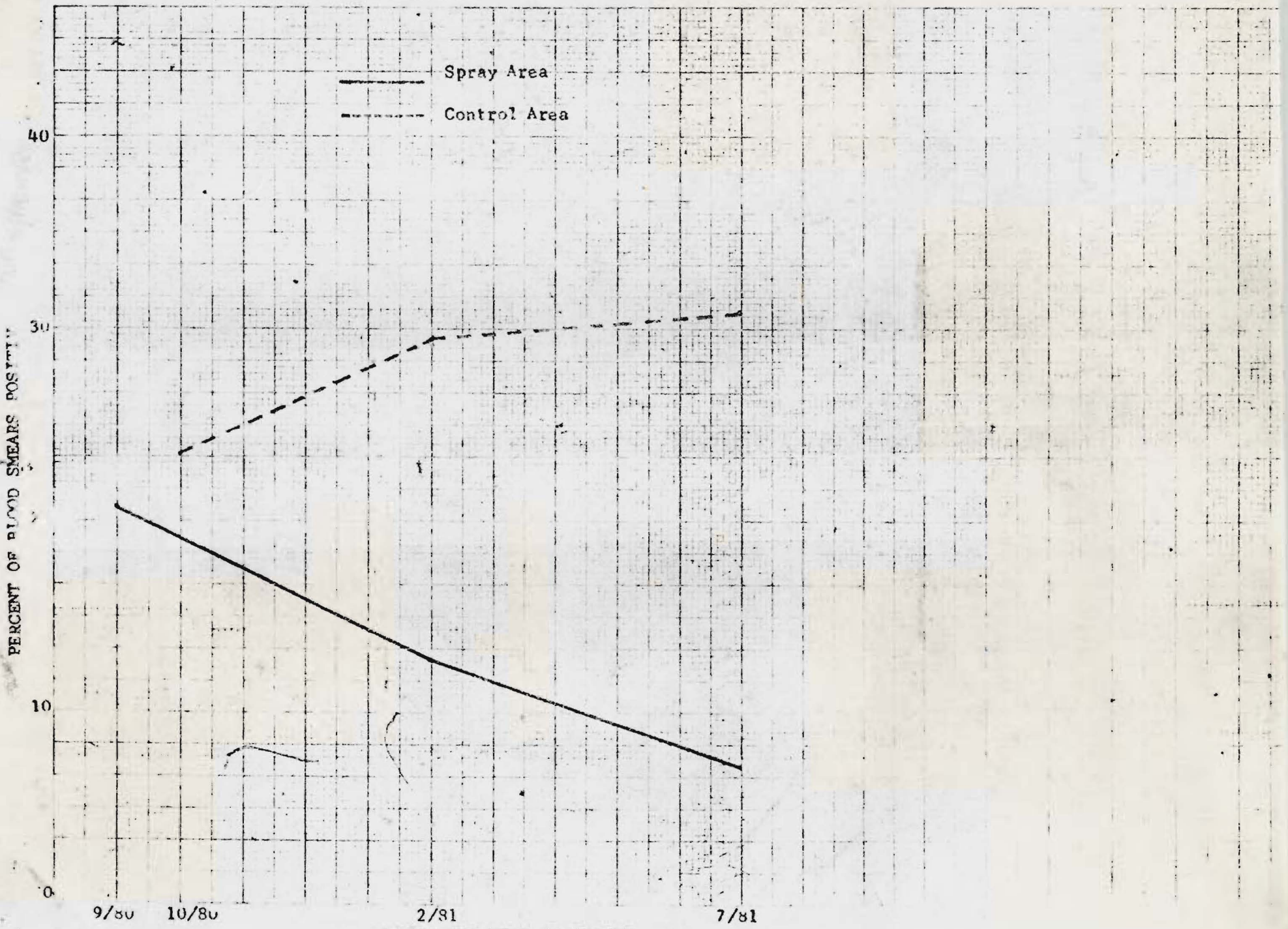

TABLE 3: RESULTS OF BLOOD SMEARS COLLECTED FROM FEVER CASES AT THE HEALTH CENTERS IN THE SPRAY AREA

	HEALTH CENTER								
	NGIDINGA			MALELE			SADI-KISANGA		
Month & Year	Smears Ex.	Smears Pos.	% Pos.	Smears Ex.	Smears Pos.	% Pos.	Smears Ex.	Smears Pos.	% Pos.
Sept-1980	150	49	33	50	10	20	32	10	31
Oct -1980	105	24	23	26	8	31	52	10	19
Nov -1980	83	30	36	8	3	38	-	-	-
Dec -1980	76	31	41	34	3	9	-	-	-
Jan -1981	7	3	43	25	1	4	-	-	-
Feb -1981	-	-	-	-	-	-	-	-	-
Mar -1981	115	31	27	-	-	-	-	-	-
Apr -1981	104	13	13	-	-	-	-	-	-
May -1981	107	23	22	26	2	8	49	24	49
June-1981	46	15	33	-	-	-	-	-	-
July-1981	48	12	25	62	13	21	51	15	29
TOTALS	841	231	28	231	40	17	184	59	32

TABLE 4: COMPARISON OF CLIENT VISITS AND FEVER CASES AT THE THREE HEALTH CENTERS IN THE SPRAY AREA FOR THE PERIODS JANUARY-JUNE 1980 and 1981.

	JAN-JUNE 1980			JAN - JUNE 1981		
Health Center	Client Visits	Fever Cases	% Fever	Client Visits	Fever Cases	% Fever
Ngidinga	2394	1413	59	2275	802	35
Malele	986	434	44	772	321	42
Sadi-Kisanga	623	332	53	501	204	41
TOTALS	4003	2179	54	3548	1327	37

TABLE 5: SUMMARY OF MALARIOMETRIC SURVEYS CONDUCTED IN THE RURAL CONTROL AREA OF BAS ZAIRE

	SURVEY NUMBER AND DATE								
	1st Survey October-1980			2nd Survey February-1981			3rd Survey July-1981		
Health Center	Smears Ex.	Smears Pos	% Pos	Smear Ex.	Smears Pos	% Pos	Smears Ex.	Smears Pos	% Pos
Kiyengo	393	67	17	339	86	25	406	94	23
Masikila	427	123	29	438	163	37	380	144	38
Kimpemba	765	179	23	544	139	26	798	249	31
TOTALS	1585	369	23	1321	388	29	1584	487	31
Reliability of Sample Size*			± 3%			± 3%			± 3%

* Barnes & Noble (1963). 95% Confidence Level. Percent in Population assumed to be 50% and a sample size for a reliability of ± 3%.

TABLE 6: SUMMARY OF BLOOD SMEARS EXAMINED FROM 0 - 11 MONTH-OLD INFANTS LIVING IN THE RURAL CONTROL AREA.

	SURVEY NUMBER AND DATE								
	1st Survey October-1980			2nd Survey February-1981			3rd Survey July-1981		
Health Center	Smears Ex.	Smears Pos	% Pos	Smears Ex	Smears Pos	% Pos	Smears Ex	Smears Pos	% Pos
Kiyengo	17	2	13	13	1	8	47	10	21
Masikila	15	4	27	10	2	20	36	12	33
Kimpemba	29	6	21	25	12	48	58	28	48
TOTALS	61	12	20	49	15	31	141	50	36

TABLE 7: RESULTS OF BLOOD SMEARS COLLECTED FROM FEVER CASES AT THE HEALTH CENTERS IN THE CONTROL AREA DURING APRIL - JULY, 1981.

HEALTH CENTER	SMEARS EXAMINED	SMEARS POSITIVE	% POSITIVE
Kiyengo	80	32	40
Masikila	162	74	46
Kimpemba	108	55	51
TOTALS	350	161	46

TABLE 8: COMPARISON OF CLIENT VISITS AND FEVER CASES AT THE THREE HEALTH CENTERS IN THE CONTROL AREA FOR THE PERIODS JANUARY - JUNE 1980 and 1981.

	JAN - JUNE 1980			JAN - JUNE 1981		
Health Center	Client Visits	Fever Cases	% Fever	Client Visits	Fever Cases	% Fever
Kiyengo	282	146	52	363	193	53
Masikila	339	146	43	372	169	45
Kimpemba	557	197	35	598*	198	33
TOTALS	1178	489	42	1333	560	42

* No data for February and March 1981.

TABLE 9: SCHOOL SURVEYS IN THE URBAN MALARIA PILOT PROJECT AREA

Zone	Date of Survey	No. Schools Visited	Smears Ex.	Smears Pos	% Pos	Estimated % of 5-14 Population Examined
Ndjili (Sprayed)	June-1979	8	923	204	22.1	2.7
	Dec -1980	8	800	46	5.8	2.4
	May -1981	8	803	64	8.0	2.4
Kimbanseke (Sprayed)	Jan-Mar 1980	10	1412	374	26.5	6.1
	Nov -1980	7	699	89	12.7	3.0
	May -1981	10	1000	131	13.1	4.4
Masina (Sprayed)	Jan -1981	9	904	122	13.5	3.7
	June-1981	9	889	104	11.7	3.6
Limete (Control)	Jan -1981	4	399	27	6.8	4.6
	June-1981	4	400	57	14.3	4.6

TABLE 10: MALARIOMETRIC SURVEYS IN THE URBAN ZONES OF THE PILOT PROJECT

ZONE	DATE OF SURVEY	SMEARS EX	SMEARS POS	% POS	95% C. Limit	99% C. Limit	% OF 0 - 9 POPULATION EX.*	% OF PREGNANT MOTHERS EX.**
NDJILI	Dec-1980 Feb-1981	4984	343	6.9	± 1%	± 2	12.4	4.3
	May-June 1981	5809	413	7.1	± 1	± 2	14.2	6.6
MASINA	Feb-Apr 1981	5998	577	9.6	± 1	± 2	20.1	11.5
	July-1981	4106	470	11.4	± 1	± 2	14.2	5.0
KIMBANSEKE	June-July 1981	4703	809	17.1	± 1	± 2	17.2	6.5
LIMETE	April-May 1981	3573	399	11.3	± 1	± 2	38.0	12.5
	Aug-1981	1822	309	17.0	± 2	± 2	19.8	5.5

* 0 - 9 year-olds estimated to make up 35.1% of total population.

** Estimate the number of pregnant women is roughly equal to the number of the under one age group plus an additional 15% to account for infant mortality. The under one age group is estimated to make up 4.2% of the total population.

TABLE 11: SUMMARY OF TOTAL CLIENT VISITS AND FEVER CASES IN THE URBAN PILOT PROJECT ZONES.

ZONE	NUMBER OF DISPENSARIES	TOTAL CLIENT VISITS*	TOTAL FEVER CASES	% OF CLIENTS WITH FEVER
MASINA	42	118,762	41,596	35.0
NDJILI	62	116,248	54,092	46.5
KIMBANSEKE	42	113,872	41,819	36.7
LIMETE	9	9,985	3,547	35.5

* Data for Masina, Ndjili and Kimbanseke are for the period July-1980 through July-1981 while that of Limete is for March through July 1981.