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REVIEW OF MALARIA CONTROL
PROGRAMS IN DEVELOPING COUNTRIES

ZAIRE, AFRICA COUNTRY SUMMARY

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CHAPTER 1

INTRODUCTION

Despite great scientific and technological achievements in the field of health, poor health prevails in many developing countries. In many of these countries, short life expectancies and very high death rates among children under 5 years of age continue. Malaria is one of the leading causes of morbidity and mortality in these countries and is particularly prevalent in Africa. The Agency for International Development (AID) has sponsored several efforts to help control this debilitating disease in developing countries. One such malaria control project is located in Zaire, Africa. It is the only AID malaria control project in Africa.

ZAIRE--THE COUNTRY, ITS ECONOMY, ITS HEALTH

The Republic of Zaire is a country of striking diversity. Its 29 million inhabitants, encompassing over 200 tribes and speaking more than 200 distinct languages, represent a rich and varied and often conflicting ethnic, religious, and cultural heritage. The topography ranges from mountains, marshes and savannahs to a dense equatorial rain forest covering more than half the total land area which sprawls across 2.3 million square kilometers--an area roughly equivalent to the size of the United States east of the Mississippi River. Straddling the equator in the heart of Africa, the nation has a synthesis of tropical climates which provides a vast incubator for numerous debilitating diseases. The national economy is marked by a sharp dichotomy between resources and economic productivity: potentially vast fertile agricultural lands, extensive forest and fish reserves and among the world's richest deposits of minerals amidst widespread poverty with an average per capita income of only \$210 and a current fiscal and balance of payments crisis.

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Despite Zaire's basic heterogeneity, examining the nation as a whole, crucial similarities in health problems of regions and rural and urban areas emerge. Morbidity and mortality, particularly among children under five years of age, are excessively high due largely to parasitic and infectious diseases and malnutrition. Housing and environmental sanitation systems are inadequate. Rapid population growth is placing a substantial strain on existing health services. Variations in health status between geographic areas of the country are more of degree than kind.

The absence of an effective national health data collection system precludes the availability of reliable information on the exact extent and nature of morbidity and mortality in Zaire. Official health statistics compiled from diverse regional reports and studies, however, paint a bleak picture. Disease has been almost accepted as the norm in Zaire, so pervasive is its impact. It is commonly accepted that nearly all Zairians have at least one intestinal or skin disease and especially in the rural areas where 70 percent of Zaire's population resides, multiple diseases are common.

Impact of disease on Zaire

The prevalence of debilitating diseases throughout Zaire exacts a high economic and social cost on the republic's development process. The effects of excessive morbidity are definite, synergistic, and far reaching. Demand for curative health services exceeds supply and limits the expansion of preventive health activities which are inherently more efficient and economical. The attainment of an adequate education for the nation's youth is seriously impeded by pervasive illnesses which lead to high rates of absenteeism and drop-outs; even among those children in school, learning ability is impaired by repeated illness and general malaise. While the exact economic cost of disease is impossible to quantify, it is clear that reduced energy levels due to parasitic, infectious and respiratory diseases, coupled with widespread

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malnutrition, severely curtail the productivity/output of the typical Zairian worker. Over the long-term, poor national health status inevitably slows down the very pace of the economic development process itself through low productivity of the labor force, excessive and premature death.

Malaria in Zaire

Malaria is the major cause of morbidity and the third leading cause of mortality in Zaire. Virtually the entire population is affected and reported cases of malaria are common. The disease is endemic in the lowland areas and occurs in unstable epidemic form in the highlands to elevations of 2,000 meters or more. It has been estimated that all children in the lowlands have at least one attack before the age of 10. In the highlands, all age groups are equally affected under epidemic conditions. Precise data on malaria rates for the nation as a whole are nonexistent. The last epidemiological surveys for malaria incidence were conducted in the pre-1960 period. It is estimated, however, that 70 percent of all patients seen for all causes have malaria and surveys of incidence in rural children have shown a range of from 5 to 90 percent positive findings. The exact level of malaria related deaths in Zaire as a whole is unknown. In the capital city of Kinshasa, however, it has been estimated that mortality directly related or indirectly related to malaria may be as high as 50 percent in the under one-year of age group in light of its endemicity and the fact that three cases of cerebral malaria are diagnosed per week at the Mama Yomo Hospital in Kinshasa.

WHAT IS BEING DONE TO CONTROL MALARIA

In the early 1950's, national malaria control projects using DDT were launched in many developing countries: By the mid-1950's, 29 countries had

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nationwide control^{1/} programs. Recognizing early successes, the World Health Organization (WHO), recommended in 1955 that control projects be converted to eradication^{1/} programs. The approach was to encompass a three to four year DDT spraying effort followed by at least three years of surveillance to detect and treat remaining cases.

Anti-malaria programs reached a peak in the mid-1960's involving almost 90 countries. From 1970 to 1975 there was a dramatic resurgence of malaria in a number of countries. The resurgence was due to a number of technical, administrative and operational causes: an increase in resistance to insecticides and drugs; a rise in the cost of oil-based insecticides; and a lack of funds to combat focal outbreaks. Also surveillance systems were poorly integrated into general health services. As a result, the affected countries believed the disease was under control, and needed no further attention. By 1976, it was generally recognized that the eradication of malaria was an elusive goal. Most programs have now reverted to a control strategy intended to reduce malaria to a point where it is no longer a major public health problem.

^{1/}Malaria eradication is designed to interrupt permanently the transmission of malaria, to eliminate any reservoir of infection within the population, to exercise vigilance to prevent the reintroduction of the disease, and to take prompt remedial action if reintroduction takes place, within a specific timeframe.

Malaria control has more limited objectives: the reduction of the impact of the disease (although the disease may and indeed is expected to continue) through an organized effort to institute, to carry out and evaluate such measures as are appropriate to the prevailing epidemiological and socio-economic conditions, and to achieve the greatest possible improvement in the health condition of a population subjected to the burden of malaria or threatened by its possible resurgence.

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Malaria control in Zaire

Historically, malaria control in Zaire has had limited effectiveness. And even though the Government of Zaire (GOZ), USAID, and WHO acknowledge that malaria is Zaire's number one health problem, there is only one small organized malaria control program. This project consisting of 3 of the 24 urban zones of Kinshasa and a small rural area tangent to Kinshasa was officially started in 1976 with an agreement between the GOZ and USAID and a project grant for \$2.3 million from USAID. At the time of its inception, the GOZ and USAID considered the project to be a model (pilot project) for eventual replication nationwide. USAID has now decided that this is not feasible and will terminate the 5-year project in 1982.

OBJECTIVE AND SCOPE

This report concerns USAID's malaria control efforts in Zaire--the history of these efforts and future USAID plans for malaria control. Our purpose was to determine:

- what are AID's policies and strategies for malaria control;
- what is status of the Zaire malaria control project and what has been accomplished by the project;
- what coordination and cooperation exist among the various elements involved in, or affected by malaria control; specifically,
 - coordination between AID, GOZ, and the World Health Organization (WHO),
 - coordination and cooperation between the respective malaria programs of neighboring countries, or between adjacent malarious areas of the same country, and
 - relationship of the AID-assisted malaria program with other AID supported development projects in Zaire.

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Scope of our review

We reviewed the malaria control projects currently underway in Haiti, Thailand and Zaire. This particular report discusses the project in Zaire.

We interviewed officials of the Agency for International Development (AID), the Department of State, Government of Zaire Ministry of Health, and World Health Organization of the country, regional and headquarters level to ascertain the degree of coordination and cooperation in and among these participating members. We also visited the urban and rural area project sites in Kinshasa, and the laboratory established by this project.

We reviewed the program agreement, employee contracts, various commodity requisition and payment vouchers, project accomplishment and status reports done internally and those contracted for with outside consultants and malaria control policy and strategy reports.

We sought information and data on the Government of Zaire's participation and funding and we focused, to the extent to which data existed, on the overall priority given to health care, particularly malaria control.

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CHAPTER 2

POLICIES AND STRATEGIES FOR MALARIA CONTROL

USAID has acknowledged that malaria is the number one health problem in Africa. AID has also acknowledged that it has fallen behind in the fight for malaria control; yet, in its recently developed strategy for malaria control, it seems to have taken up a strategy classified as a "holding operation" emphasizing curative measures rather than direct control of the malaria disease. It is confusing to us exactly what USAID's commitment to malaria control is.

In a recent functional review of its programs in health and nutrition, the USAID Bureau for Africa identified malaria as the leading health problem in tropical Africa. Some 26 countries were identified as having major malaria problems, and malaria incidence was estimated at over 130 million cases annually--more than the rest of the world combined. The annual death toll among children under the age of 14 was estimated at a million. The Bureau went on to observe that of the 66 health projects in Africa to which bilateral AID assistance was being provided in 1979, only two dealt with the problems of malaria. Currently, USAID has only one small malaria control project in Africa. This project is located in Zaire.

USAID'S MALARIA POLICY

The USAID African Bureau realized in 1979 that with only two AID malaria programs in Africa (now only one) and the enormity of the malaria problem, there was a glaring disparity between the challenge and the response. The Bureau concluded that "given the past history of failure of anti-malaria efforts in tropical Africa...it appears highly unlikely the appreciable progress will be made without external assistance and much stronger international encouragement than has been provided heretofore." To explore this conclusion, the Bureau requested the American Public Health Association to convene a Strategy

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Advisory Group to include leading experts in a wide disciplinary range;--malariology, epidemiology, entomology, tropical medicine, parasitology, engineering, health education, economics, anthropology, sociology and health services. The expert group was supported by WHO representatives, from the Geneva headquarters and from the two WHO regional offices in Brazzaville and Alexandria, and by senior officials from a number of African countries.

This Strategy Advisory Group concluded:

- Of the health problems facing tropical Africa malaria poses the greatest threat to life, to the quality of life and to socio-economic development.
- Constraints to malaria control are particularly severe in Africa. These constraints were not fully realized in the past and this led to a pattern of failure in anti-malaria programs. In consequence, many of the nations of tropical Africa have come to regard the malaria problem fatalistically.
- It is improbable that most nations of tropical Africa can make appreciable progress against malaria without major external assistance and encouragement.

The advisory group stated that a strategy of malaria control rather than eradication is the only one applicable to tropical Africa; the extent to which the impact can be reduced is a function of technical feasibility, administrative capacity and resource availability.

Endorsement of WHO's strategy

In 1977, WHO had developed a series of "tactical variants" which relate control tactics to the nature and extent of malaria problems in a given country and to the level of control which the country selects and can achieve. The

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Strategy Advisory Group and AID have endorsed these variants. The variants range in priority order from curative measure for those who have malaria to actual control of the disease in variants 3 and 4.

Tactical variant no. 1

Goal: Reduction and prevention of mortality due to malaria. As an initial and overriding priority, within the limits of the outreach capacity of the health care delivery system, curative administration of an effective drug to all suspected severe cases of malaria.

Tactical variant no. 2

Goal: Reduction and prevention of mortality and morbidity, with special attention to reduction of morbidity in high-risk groups (children and pregnant women). A satisfactory organization (primary care system) must exist to distribute drugs to these groups.

Tactical variant no. 3

Goal: Same as variant no. 2, plus reduction of the malaria prevalence. This variant assumes the existence of an organizational nucleus and a sufficient number of trained personnel to apply the methods and to undertake an epidemiological evaluation of the results achieved.

Tactical variant no. 4

Goal: Countrywide malaria control with the ultimate objective of eradication has been achieved; and vigilance in countries that are naturally malaria-free but are threatened by the introduction of the disease.

In March 1981, the African Bureau of USAID stated that AID is reconsidering the desirability of supporting malaria control in Africa. As part of this same statement the Bureau endorsed the WHO variants and the following recommendation of the Strategy Advisory Group:

The approach to malaria control in rural Africa recommended by the Strategy Advisory Group is a holding operation generally feasible and thoroughly worthwhile. Chemotherapy (variant 1) and chemoprophylaxis (variant 2) can save lives and alleviate morbidity (and of course, reduce suffering), but will have no effect on the reservoir of malaria in the rural areas. The program is not time limited. It continues forever--or until the availability of a still unknown technique (vaccine?) of dealing with the total problem of malaria at affordable levels of expenditure.

The Bureau further stated that anti-malaria efforts should consist of the distribution of drugs through the primary health care systems. Vertical (categorical) efforts for malaria control are to be avoided because they

are too costly and too logistically difficult in Africa.^{1/} WHO has been recommending the integration of anti-malaria efforts into the infrastructure of a primary health care system for years. However, WHO has emphasized that such an integration must be well planned and approached cautiously. The primary care system must be able to support malaria efforts without any detriment to these efforts, and malaria incidence must be at such a level that the problem is not too much for the primary care system to affectively attack.

SEEKING CLARIFICATION OF AID'S MALARIA POLICY

In view of the enormity of the African malaria problem and AID's adoption of a "holding operation" rather than a more direct attack, we asked Zaire AID officials for an explanation.

USAID comments

We asked the Director, AID in Zaire whether AID has enough resources to achieve a long-term effect in malaria control. He told us given the fact, especially in Africa, that host governments are unable to provide services and financing for national malaria programs, AID may indeed just have to make a minimal investment in malaria control using whatever existing institutional non-government mechanisms exist. In the case of Zaire, this would mean using the religious primary care system to distribute anti-malaria drugs. He told us this strategy may only be an interim measure while awaiting some breakthrough in malaria control, such as a vaccine.

We asked why AID malaria efforts have declined to the point where there is only one designated malaria program in Africa. He told us in his opinion, AID has had difficulty in maintaining programs for which achievements

^{1/}AID's only designated malaria project in Africa (Zaire) is a vertical pilot program. See Chapter 4.

cannot be quantified; for example, malaria. Therefore, given scarce resources, the Director believes AID has made the decision to identify and invest in those programs, efforts, and diseases where accomplishments can be quantified. An example of this is the measles eradication program in which accomplishments can be quantified in the number of children that have been immunized and thereby protected against measles. He said this is not true of malaria. Malaria is a unending effort. People become infected, are cured, then reinfected.

CONCLUSION

From our review of the evolution of AID's malaria control strategies and discussions with officials in Zaire, we can only conclude that AID is now approaching malaria control differently than in the past. And it appears to us that this difference includes a less direct attack on the malaria disease or as the Strategy Advisory Group describes it--a holding operation. This holding operation includes giving priority to curing and to some extent protecting people through the distribution of anti-malaria drugs by primary health care workers. It is not our intent to argue with the experts as to whether this is the "right" approach or not. However, we would like to point out that malaria control efforts have failed in the past because of the lack of a direct constant attack and a lack of vigilance. Chapter 3 contains some other cautions from WHO for implementation of AID's African strategy.

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CHAPTER 3

MALARIA CONTROL IN ZAIRE

The USAID-sponsored malaria project will have accomplished many of its major objectives by the scheduled end of the project. However, the malaria control technique and other expertise developed during this live project--a project that was intended to be replicated nationwide--will probably be lost.

This may occur because of a change in AID's malaria strategy:

- a change in AID's malaria strategy (away from spraying techniques and toward antimalaria drug distribution);
- the apparent lack of feasibility of a national spraying program to control malaria; and
- the possible lack of continued support by the GOZ and AID for the cadre of malaria workers and laboratory developed during the project.

We reviewed this malaria control effort in Zaire in terms of project objectives, accomplishments, and other project descriptors, and also the long-term benefits of the project with respect to AID's future Zairian malaria control plans.

PROJECT DESCRIPTION

A \$2.27 million USAID grant was used to finance a five year endemia and communicable disease program in Zaire. There are two components to this effort-- a measles component and a malaria control component. The malaria component is the subject of our study.

The malaria pilot project covers 3 of the 24 urban zones of Kinshasa and a small nearby rural area. The project was to start in 1976 and run for five years but was delayed until late 1977 because of the difficulty in recruiting a malaria advisor for the project.

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The goal of the project is directed towards reducing the morbidity and mortality caused by endemic and communicable diseases. The purpose of the project is to strengthen the Government of Zaire's institutional capacity for monitoring and controlling endemic and communicable diseases. This was to be done by:

- (1) The establishment in five years of a malaria control program in the Kinshasa Region and in one nearby rural area. This program was to serve as a model for eventual replication nationwide.
- (2) The extension and integration of these and other endemic and communicable disease programs into the health delivery systems of five development zones, with an estimated population of one million.
- (3) The development of a cadre of Zairian health workers competent to deal with the problems of endemic and communicable diseases and environmental health.
- (4) The development of an epidemiology capability within the GOZ's Department of Health for assessing, monitoring and evaluating communicable disease problems and programs.

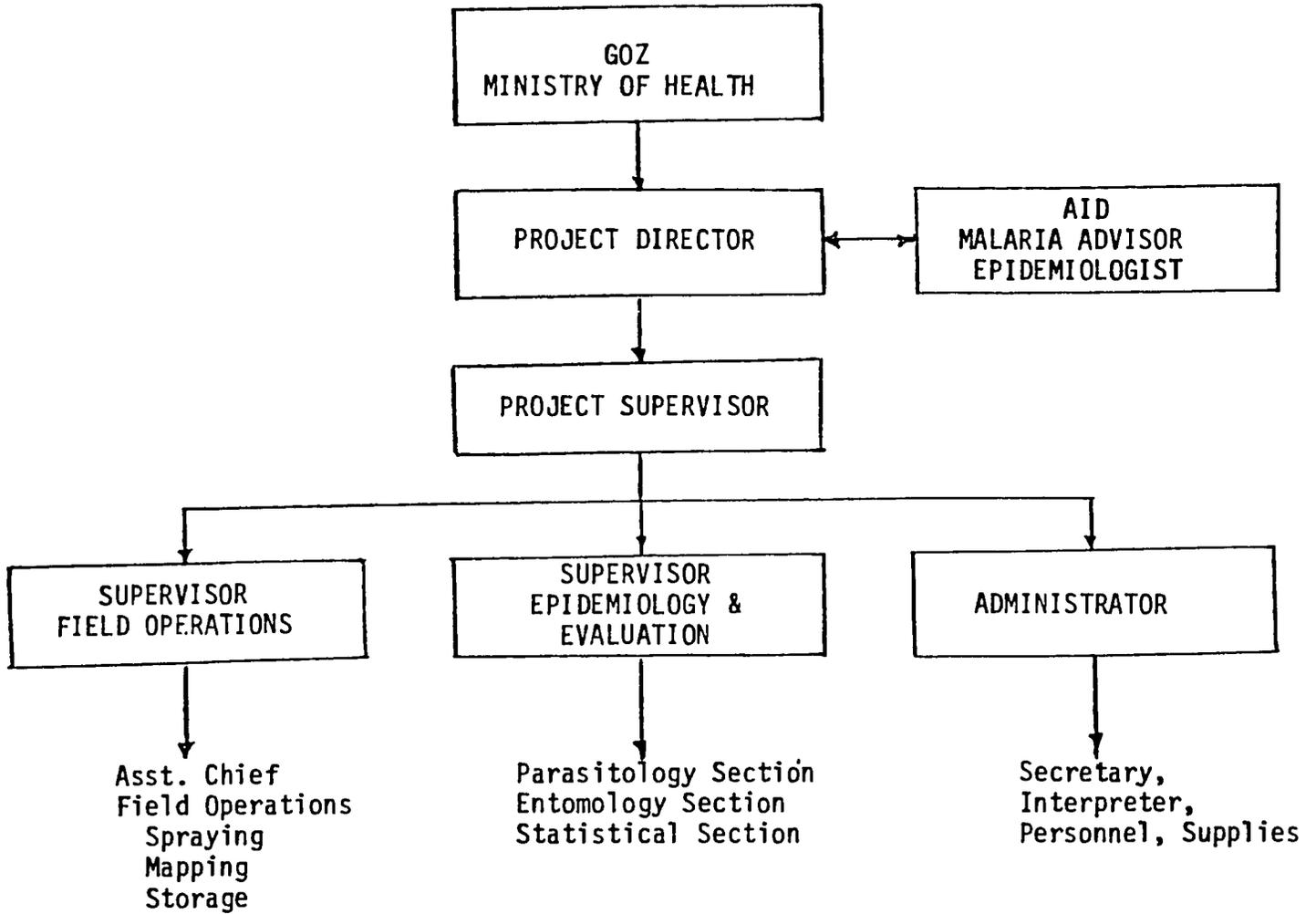
The main technique tested during the project was domiciliary spraying with DDT for the control of mosquitos.

Project structure/organization

Under the project agreement AID is responsible for furnishing long-term technical advisory services in epidemiology and malaria control field operations. AID contracted with a project advisor (malaria advisor) and obtained an epidemiologist from the Center For Disease Control (CDC) to fulfill this commitment. The GOZ was to be responsible for the overall direction and

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PROJECT ORGANIZATION



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The main operational function of the project has been the spraying of houses within the three zones of Kinshasa and a small rural area on the outskirts of Kinshasa. The following table shows the project coverage since the start of the project through September 1981.

<u>Project Coverage</u>		
<u>Urban</u>		
<u>Number of Houses Sprayed *</u>	<u>Number of Inhabitants Protected</u>	<u>Total DDT Used</u>
30,000	300,000	119,944
<u>Rural</u>		
2,341	7,775	6,662

*Spraying is done in cycles and part-time crews are hired and trained for these spraying cycles. The houses have been sprayed more than once; the urban as many as five times during the project.

In addition to this activity, the epidemiological laboratory has been quite active since the arrival of the CDC epidemiologist in July 1980. See section on Surveillance and Laboratory.

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Project # 0112

AID's contribution for malaria control amounts to \$2.267 million^{1/} over 5 years. This covers technical services, commodities (equipment, vehicles, insecticides, etc.), participants' per diem for training and other costs.

WHO's contribution is supplying technical advisors and sponsoring training courses where they pay all travel and per diem costs.

GOZ's contribution is made through counterpart funds and the provision of office, laboratory and warehouse space. Counterpart funds are generated by the P.L. 480 agriculture program. GOZ's contribution is about 4000 zaires a month for personnel salaries which equates to approximately \$10,000 annually. Since the 1976 currency devaluation, GOZ has devalued its currency four times, resulting in a cumulative depreciation against the U.S. dollar of about 85 percent. In March 1976, 1 zaire=\$1.23 U.S., as of June 1981, 1 zaire=\$.18 U.S.

In discussions with WHO representatives, it was believed 10 percent of a country's gross national product (GNP) appropriated for health care showed a government commitment to reduce disease and raise the standard of living. GOZ's health budget is about 4 percent of their total budget. However, since the beginning of this malaria control project, GOZ has not budgeted an amount specifically for malaria control.

^{1/} This also includes the measles vaccination program portion.

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AID purchases all commodities used by the project. They enter duty free under the Ambassador's name for the mission. Generally, commodity purchase and shelf life have not been a problem for this project. However, there have been instances of shipment delays and non-availability of critical laboratory chemicals. In the latter case, a waiver was granted for the purchase of laboratory chemicals in Brazzaville, Congo--the closest source of supply. But these instances have not significantly hindered the project.

Because of Zaire's economic situation, an inflation rate over the past 2-3 years of about 50-100 percent (and currently hovering around 80 percent), one problem which has plagued the project is rising costs. Since March 1978 the price of DDT, the insecticide used to control mosquitos, has gone from \$.44 per pound to an estimated \$1.44 per pound as of January 1981. This increase has made domicile spraying too expensive to carry out on a national scale by the Government of Zaire-Ministry of Health.

The labels on project supplies are in English, but that is not a problem according to the project advisors since all workers are trained in their proper use. If a question arises in the laboratory concerning use of the chemicals, the workers have access to a translator and a French/English dictionary.

The project is a mosquito control project with minimal drug purchases. Mostly what drugs are purchased have been dispensed to people found to have malaria through laboratory testing. The drugs are not routinely dispensed to workers as a preventative measure.

As of August 15, 1981, \$703,657. has been spent on project commodities of which \$230,414. is for malaria control.

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Training

One of the project objectives is to strengthen the GOZ institutional capacity for monitoring and controlling vector-borne diseases, especially malaria. Qualified, experienced personnel have been hard to find for all phases of the malaria control project. As a result, the project advisors have had to train many people with little or no background for various positions. WHO has contributed to this endeavor by sponsoring various courses in different areas of malaria control.

Laboratory training

The project epidemiologist provided us with a list of training courses given from August 1980 through July 1981.

- The microscopists and Chief of each section received 12 hours of formal training in the laboratory diagnosis of malaria by a WHO representative. 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.
- Six entomology aides were given a one week entomology course that was designed and conducted by the staff.
- Five chiefs of the groups for the spray operation were cross trained to do blood smear collections.
- All staff have received and continue to receive on-the-job training on a daily basis.

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Current on-the-job training includes use of laboratory management techniques. Zaire does not have enough trained mid and upper management expertise. College level managerial courses are needed to provide this cadre of people.

Two future training courses are being developed. One is a six part course on the laboratory diagnosis of malaria. This course consists of tapes and 35mm slides provided by Center for Disease Control/Atlanta. The tapes are now being translated into French. The second course is drug sensitivity testing. A WHO consultant has been requested to provide this training and to assist in the development of and organized drug sensitivity testing program for malaria.

Mosquito control

The project malariologist said he provided the training himself through on-the-job experience. The men selected to do mosquito spraying are given a 6 1/2 day spray application training course. The best course graduates are then hired for the actual spray campaign. He said he has tried to arrange administrative training through AID's Office of Human Resources, but so far has been unsuccessful. The Office of Human Resources does not follow up on requests to get courses started.

While the training that has taken place has gone a long way in providing the institutional capacity for monitoring and controlling vector-borne diseases, more training needs to be provided. The epidemiologist said they know very little about drug resistance in Zaire. Since there is a possibility this project may be extended one year to switch to drug distribution, additional research and training will be needed. We concur with both project advisors that a local WHO training facility is needed. Establishment of a training facility will be useful to train health workers in drug distribution and evaluation and will help in doing drug resistance research if the project is extended.

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if the project is allowed to end, the training facility can support GIZ's efforts to maintain the laboratory and malaria program by providing training locally rather than sending people to WHO's center in Lagos or to the U.S.

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Supervision

Some malaria control projects have failed in the past because of poor supervision of the activities of the personnel involved in the projects. The project advisor and epidemiologist told us there is no problem with supervision of personnel in the project. They said the supervisors take pride in their job and there is an adequate supervisor to worker ratio to insure good monitoring of activities.

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Project surveillance efforts

Surveillance efforts to monitor and track the incidence of malaria are very important in any strategy for malaria control. Programs have failed in the past because of lack of an adequate surveillance effort.

We discussed the malaria surveillance efforts of the pilot project with the project's epidemiologist. He told us that the project does not do surveillance in the true sense of the term. A true surveillance program involves going out and looking for every case of malaria, treating these cases, and tracking the patients, and this is done on a continual basis. A surveillance team would also do malaria surveys and evaluations and would help formulate strategies based on their findings. The epidemiologist said surveillance efforts of the Zaire project's laboratory section involve taking blood smears and analyzing these smears for selected groups to help determine the effects of the spraying on the incidence of malaria in the project area. The laboratory personnel also monitor the resistance of the mosquito to DDT to see if they are becoming more resistant with each successive spraying.

According to the epidemiologist the laboratory has adequate equipment and staff to collect and analyze blood smears for incidence of malaria and to test for mosquito resistance to the insecticide DDT. The staff consists of four chiefs (Laboratory, Parasitology, Microscopy, and Entomology), 10 microscopists, 6 entomology aids, 15 blood smear collectors, 4 dispensary visitors, 3 drug distribution agents, 1 statistician, 2 statistical aides, 1 typist, and 1 blood smear stainer. Each microscopist analyzes 50 slides per day and the supervisor randomly checks this analysis for accuracy. If a slide shows incidence of malaria, laboratory field crews return to the individual and administer a curative dose of antimalaria drugs and put the individual in touch with the local dispensary.

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The epidemiologist has done an evaluation of the project's malaria control spraying efforts. An analysis of the incidence of malaria in the sprayed areas (urban and rural) versus that in areas not sprayed showed some impact of the spraying.

Results in the rural area

Three rural area surveys were performed from July 1980 to July 1981. Results showed that spraying reduced the incidence of malaria. The slide positivity rate (incidence of malaria) went from 20.7 percent in July 1980 to 7.2 percent in July 1981 in the spray area, while in the control area (no spraying) the rate went from 23.0 percent in October 1980 to 31.0 percent in July 1981. There was an overall reduction of 65.2 percent in the rural project area.

Urban area results

The urban area consists of 3 of Kinshasa's 24 zones. During July 1980 to July 1981, the project carried out malarimetric surveys, school surveys, and retrieved ~~fever~~^{cool} statistics on clients from 115 dispensaries in all of the zones.

The results of blood smear analysis at schools in the three zones showed a drop in the malaria positivity rate after spraying cycles. Malarimetric studies taking blood smears from 0-9 year old children and pregnant mothers were conducted in two of the sprayed zones. Results indicated little change in the malaria picture. The epidemiologist hopes he will have enough time during the remainder of the project to further investigate whether there was less change in the incidence of malaria in the urban versus the rural project areas.

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Project evaluations

There have been two evaluations of the project--one internal by the malaria advisor and one by an outside consultant. Neither was very critical of the project.

Internal evaluation

The malaria advisor has been evaluating and reporting on the project in his quarterly reports to AID. And in 1980 he wrote an annual evaluation of the project. In this report he narrated the logistical accomplishments of the project, i.e., number of houses sprayed, number of inhabitants protected, number of pounds of DDT used, and number of project personnel used to perform the spraying. He also mentioned that

- the lack of a coherent health education component in the project has been a weak point in informing inhabitants in the project area about the malaria control program. In malaria control programs spraying refusal rates by inhabitants increase after each successive spray round because of the development of resistance to DDT by other household pests, i.e., roaches, bedbugs, and fleas. This high refusal rate can be countered through the use of a well organized health education program.
- the project had to develop its own maps of the operational project area locating and measuring each house in the urban zones and rural area.
- the epidemiologist arrived in July of 1980 and during remainder of the year conducted malaria surveys in the rural and urban areas, e.g., took and analyzed blood smears for incidence of malaria.
- a consultant was assigned to prepare a training plan for Zairean malaria control. The malaria advisor thought that the resultant report was too theoretical and extensive for the current project but might be useful for a national malaria program.

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--a USAID Anti-Malaria Support Strategy team for Sub-Sahara Africa visited Zaire. The team concluded, "The enormity of the logistical problems of Zaire makes the possibility of creating an effective, nationwide (malaria) program very remote, at present. The best alternative under these very difficult circumstances . . . would seem to be the development of further pilot programs in various other regions of the country."

--an outside consultant had evaluated the project in November and the malaria advisor generally agreed with the findings and recommendations of the consultant.

Outside consultant's evaluation

At AID's request, the American Public Health Association (APHA) obtained a consultant in international health to evaluate the malaria component of AID's endemic and communicable disease control program in Zaire. The consultant did this evaluation in November 1980.

The consultant identified what he considered to be major problems.

1. Lack of adequate participation by WHO.
2. Failure of GOZ to assign to the project director a deputy. (The director is part-time and the consultant believed the deputy could fill in when the director was not working on the project.)
3. Weakness of health education of the target population. (The project obtained some health educators from the GOZ in 1981.)
4. Inadequate emphasis on the importance of pre-operational baseline data. (A baseline study was not done before the project began. GOZ failed to call in WHO to do this.)
5. Lack of provisions for formal training of malaria control. (Most training has been on-the-job training performed by the malaria advisor--see section of our report on training.)

The consultant also made some special comments and recommendations.. He stated

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"The malaria control pilot project requires further refinement, but, in general, it is a viable and reasonable effort to pave the way for an expanded national antimalaria program."

1. Extend the project for one year. The consultant concluded that "Because the national health delivery system is inadequate, the best alternative would be to replicate the current pilot program in other additional programs as additional trained manpower and other resources become available." (Extension of the project is being considered.)
2. Request a WHO or joint USAID/WHO evaluation of the draft national anti-malaria plan. (This has been requested.)
3. Explore the possibility of establishing a malaria training center with technical assistance or guidance from the WHO. (Not being considered to any extent.)
4. Request that the minister of health assign to the malaria program a full-time deputy director. (There is no deputy director; there is a project supervisor and administrator.)
5. Select and add to the pilot project a rural control area for comparative studies.
6. Try to decentralize the operations in the various zones to conserve fuel and to develop local managerial talent. (This has not been done.)
7. Use available Peace Corps assistance in the decentralized program. (No Peace Corps workers are being used.)
8. Use counterpart funds to the program to furnish adequate typing/ clerical help and other support services, such as vehicle maintenance. (Counterpart funds are used for salaries.)

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9. Maintain a master file on reports on progress and problems, including supporting documentation. (AID and project have program files.)
10. Recommend that the malaria advisor enroll in a course on scientific report writing while on home leave. Many U.S. Government agencies offer these courses. Enrollment in a course on management by objectives (or its equivalent) is also advised. (This has not been done; advisor has not time for this.)
11. If the GOZ opts for a national anti-malaria program, the mission should maintain on its staff an advisor with field experience in anti-malaria campaigns. This person would assist in integrating the malaria program into the general health infrastructure and in monitoring AID input. (AID is considering this.)
12. By the spring of 1981, enough malarimetric data should have been collected and enough operational experience acquired to determine accurately the cost-effectiveness of malaria control in Zaire. (No cost-effectiveness analysis has been done.)

Other project problems and delays

Events occurred which delayed the timetable for the project. For example, the original project agreement was signed in 1976, yet the project did not officially start until late 1977 because it was difficult for AID to find and recruit a malaria advisor. When the advisor arrived in Kinshasa he found that he had to start the project almost from scratch.

--GOZ did not call in WHO to do a baseline study to determine existing malaria. A limited baseline study was done in November 1980 by the project after the first sprayings. However, the project personnel

DRAFT

cannot determine any attributed results from the beginning of the project because there is no base for measuring results.

- The epidemiologist did not arrive until July 1980--about one year had elapsed between request and arrival. According to an evaluator of the project this delayed the provision of urgent assistance in measuring the incidence of malaria and the resistance of mosquitos to the DDT sprayed.
- Necessary malaria control commodities (insecticide) were scheduled to arrive in January 1978 but did not arrive until April 1979.
- Spraying the urban area did not begin until 1980 and in the rural area not until 1981.
- GOZ may not be giving malaria control adequate priority. See next section of this report.

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Priority of malaria control

Malaria is a very expensive disease. It affects a country's economic development in terms of manhours lost and nutritional loss. An effective malaria program takes 5 years minimum to reach the control point. As the economic condition of people improve, malaria declines by itself and doesn't require such intensive care and control. But malaria control should be a high priority in the early years of a program. Zaire is not effectively making malaria control a priority.

GOZ's budget for health for 1979 and 1980 is less than 4 percent of the national budget. There is no amount specifically allotted for malaria control. What the government does contribute to malaria control amounts to approximately 50,000 zaires a year (less than \$10,000 U.S.). This sum is for personnel salaries; there is no budget for operational expenses. According to the GOZ program director, to date the GOZ has only promised more funding but so far only provided for salaries.

GOZ's obligations under the U.S. project agreement have been partially fulfilled. For unfulfilled project terms see Chapter 5, Coordination and Cooperation. The Public Health Officer of AID felt that GOZ did relatively meet the program objective of now having a cadre of people with endemic disease experience to assist on future programs by establishing a working laboratory. However, the likelihood of maintaining project accomplishments after external assistance terminates is not good. The project epidemiologist indicated that if the project ends and funds are not provided to GOZ for the support of the laboratory, the laboratory would continue to exist for 6 months at most. The GOZ project director said the government would like to continue laboratory operations by incorporating it into the primary health care system. He went on to say the present primary health care system is in a pilot project stage now. In our opinion, the present health care system could not support,

M. Add lack of National Health Plan at time of Proj start and none now

DRAFT

financially or administratively, the laboratory operations. Therefore the likelihood of continuance is remote. The program director said if the primary care system cannot integrate the laboratory operations, GOZ will ask for another donor to help maintain operations.

Before this AID malaria project, GOZ's efforts to combat malaria are sketchy. The project malariologist said some anti-mosquito control was being done in the Kinshasa area, but the details of what took place aren't available.

Malaria control, based on the current level of GOZ funding and project support is given a very low priority in terms of government commitment. In our opinion, the government could do more to show its commitment to controlling malaria, such as allocating a specific amount for operational expenses of malaria control. Until the government decides to make an effort to control the disease and truly support that effort, any malaria control effort will be only marginally effective.

DRAFT

Accomplishment of objectives

By the scheduled end of the five year project, USAID and GOZ will have accomplished many of the original objectives of the project. These accomplishments are mainly due to the efforts of the malaria advisor and epidemiologist who organized and implemented the effort.

Project personnel can claim the following accomplishments:

- the establishment and successful operation of a pilot project for malaria control in selected urban zones of Kinshasa and one nearby rural area, with a decrease in mortality and morbidity among children;
- the development of a cadre of GOZ personnel competent to help plan develop and operate programs for the control of malaria in Zaire.

By the scheduled end of project in 1982, project managers will not have extended and integrated these malaria control principles into the Zaire health delivery system as originally envisioned. And the project will not be a model for replication nationwide because of the expense and logistical problems of the vector control spraying technique and a change in USAID's antimalaria strategy. USAID will now give program priority to malaria curative efforts by the distribution of antimalaria drugs through Zaire's health delivery system. Spraying will not be used as a technique for malaria control. The Public Health Officer told us that the feasibility of replicating a spray program nationwide should have been questioned at the time of initiation of the pilot project.

DRAFT

FUTURE PROSPECTS FOR MALARIA CONTROL

USAID has come to a decision point in its malaria control efforts in Zaire. AID plans to integrate all future anti-malaria measures into the existing primary health care system. However, AID must decide exactly how this is to be done. Should the current project be extended (or a new pilot project started) to test this integration and better identify the structure and capabilities of the primary care system, and in general help smooth the transition from the pilot project to this new effort? Or should current project accomplishments be allowed to lapse and AID malaria efforts be directly integrated into the primary care system regardless of the extent of malaria incidence and the status of Zaire's primary care system?

We agree with integrating malaria efforts into the infrastructure of a primary health care system. However, we are concerned about the status of this system in Zaire. Can it accept and support an anti-malaria effort when the incidence of malaria in Zaire is acknowledgeably high? Can the system provide malaria expertise, training personnel, planning, surveillance, logistical support and other items needed for a successful effort? Or can the system be expected to only provide to some extent yet unmeasured a means to distribute anti-malaria drugs to a segment of the Zairean population? We discussed these questions with those currently involved with malaria control efforts.

Comments by the malaria project advisors

The USAID malaria project advisors are familiar with the impediments to malaria control in Zaire. They are also familiar with the primary health care (PHC) system in Zaire. They told us they are very much in favor of the eventual integration of anti-malaria measures into an existing well organized primary care system. However, the advisors told us the GOZ does not have a PHC system. The only existing entity which could in any way be described as

DRAFT

a PHC system is a "spotty" network of religious hospitals and dispensaries.

They said this system lacks

--organization, and the properly trained personnel for malaria control, and

--a cadre (or nucleus) of personnel to do malaria control, planning, surveillance, and evaluation.

The malaria advisor and epidemiologist believe the people trained under the current project could form the nucleus for any follow-on malaria control efforts. However, without continued support from the U.S., GOZ, or another donor this cadre of people will disappear, perhaps within six months after the end of the project. The malaria advisor explained to us that it was one of the objectives of the project that malaria control efforts be integrated into the PHC system in five zones of Kinshasa on a test basis, ^{done} but this has not been

Restructure

The project advisors are very skeptical that integrating anti-malaria efforts into PHC ^{the system} will be effective at this time because of the high incidence of malaria and the condition of the PHC system. The epidemiologist said the entire strategy depends on the PHC worker who is already overworked. And now he or she is going to be asked to add to their workload at a set salary; trudge through rain and mud to pass out malaria pills. He told us the technique of using anti-malaria drugs is good, but he believes the current primary care system is not.

The malaria advisor and epidemiologist recommend that the current project (or some other effort) be extended to

- (1) inventory the present PHC system to determine what really exists and what the capabilities of this system are,
- (2) test the method for distributing and using anti-malaria drugs and to analyze any resistance to these drugs,

DRAFT

- (3) give the PHC system aid in getting organized and in recruiting and training the necessary people for an anti-malaria effort,
- (4) develop a national malaria plan for Zaire which would include integration into the PHC system. (The epidemiologist said he would consider the current project a failure if this is not done), and
- (5) maintain a central nucleus of people who are able to plan, monitor, and evaluate anti-malaria efforts in Zaire.

Restructure -

The advisors said if these things are not done any future anti-malaria efforts will be ineffective. They pointed out that the religious and GOZ hospitals and dispensaries in Zaire have been distributing anti-malaria drugs to some extent for years, yet the incidence of malaria continued^s to rise. So there is no guarantee that the PHC system will be successful in any future anti-malaria efforts unless certain things are done to ensure this.

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Comments of the project director

The GOZ project director told us that the project should be extended and a bridge formed between current efforts and the proposed new effort of integrating malaria control into the primary care system. He said the primary care system is currently unorganized, lacks trained personnel, and has no nucleus of malaria expertise at any level.

DRAFT

Comments by AID's Public Health Officer (PHO)

The PHO agrees that the PHC system as it exists does need some development. However, he believes it is at a point where it can provide anti-malaria services. He told us that anti-malaria drugs are already being distributed in certain rural areas as part of AID's Health Systems Development project. AID is also starting a new rural health project which will help reorient the present predominantly curative health care delivery system to one emphasizing prevention, promotion, and basic curative services. The services offered will vary slightly among centers, but will definitely include basic curative services for malaria (WHO variant 1.). The PHO told us when this rural project is fully developed it will provide approximately 15 percent of Zaire's population with drugs, health education, treatment and environmental advice.

The PHO has recommended that the current project be terminated as scheduled. He told us AID may consider some minimal support, perhaps through counterpart funds, for a few of the GOZ personnel who have developed an expertise in malaria control. However, he told us this effort would not be the extensive one suggested by the current project advisors.

A warning from WHO

Representatives from the Malaria Control Program at WHO Headquarters told us they have reviewed malaria strategies of the region of which Zaire is a part. And they believe it may be impossible to implement because of the limited resources ^{and logistical problem} in Africa. The regional strategy consists mainly of WHO variants and ^{is} essentially the same as the AID African strategy. * The WHO representatives stated they believe it is necessary to integrate malaria efforts into the primary care system. However, in many African countries this system does not exist. So each situation has to be analyzed on its existing resources. They warned that malaria incidence must be at a level where the primary care system can be handled. ~~And~~ the primary care system should be looked upon mainly as a logistical distribution system for reaching the most people. A nucleus of malaria planners, analysts, and evaluators must be maintained. (Malaria efforts should not be integrated into the primary care system at the detriment of malaria control. They said this has happened in the past and programs have failed.) ~~In addition,~~ ^{they} told us agencies involved in malaria control can not afford to adopt any type of minimal hold ^{ing} ~~action~~ ~~effort~~ pending a break through in malaria research. If this is done, malaria will increase and be even more difficult to control. They said if a vaccine is discovered, it will only be another tool for fighting malaria--not the final answer.

CONCLUSIONS AND RECOMMENDATIONS

We believe the current project has accomplished many of its original objectives. However, we also believe that some objectives will not be accomplished for various reasons and believe there have been problems inherent in this project which may plague future efforts.

The GOZ and AID will not be able to replicate the current malaria control project nationwide. We agree with the public health officer and malaria advisor that the feasibility of a nationwide spraying program should have been questioned at the beginning of the project. With this in mind, perhaps AID should have pursued the objective of testing the integration of malaria control into the PHC system earlier. It now appears that this objective of developing a national malaria program for Zaire will not be helpful unless there is a project extension.

We also question whether the GOZ technical expertise, cadre of trained people, and laboratory developed during the project will continue to exist after withdrawal of U.S. support. The GOZ has acknowledged the severity of health problems and yet has given these problems very low administrative and financial priority. We believe this priority is a necessary element for any future successful malaria effort. Unfortunately, we and USAID do not see any tangible change in GOZ's priorities in the near future.

We believe that the lack of good coordination and cooperation between the different agencies (AID, GOZ, and WHO) involved in the current malaria effort has hindered overall success. There is also evidence of lack of communication between the project personnel and USAID management. We believe that any future efforts will be handicapped unless coordination and cooperation is improved. We suggest a means be found for regular, continued communication between all involved.

DRAFT

As for future USAID malaria control plans in Zaire, we believe there are enough knowledgeable people questioning the condition and capability of the primary care system for AID to thoroughly investigate the system. And having thoroughly investigated the PHC, ^{System} AID should write and ^{help} ~~help~~ implement a detailed plan for future malaria control in Zaire based on existing health care capabilities and available resources.

COORDINATION AND COOPERATION

COULD BE IMPROVED

The malaria control project agreement describes the contribution and type of assistance each participant will provide. Within and among the project participants (AID, GOZ-Ministry of Health, and WHO) there are several instances where coordination and cooperation was poor or totally lacking. There were incidents of technical assistance promised that did not materialize; and project decisions being made without consulting the program managers. This general lack of coordination and cooperation has led to unplanned project management.

Lack of coordination/cooperation between interested parties

According to early project papers and the project agreement^{1/}, subject to GOZ's request, the WHO Regional Office for Africa agreed to furnish the technical expertise for the collection and analysis of the initial baseline data from which a plan of operations was to be developed for the malaria control program in Kinshasa. WHO was to have the prime role for technical assistance pertaining to the medical, technical, and entomological aspects of the program. AID's technical assistance in malaria control was to focus on field operations, logistics, and motor transport and maintenance. GOZ agreed to (1) request the WHO malaria team to conduct the baseline study, (2) request the assistance of the United Nations Development Project (UNDP) to provide commodities for an extended malaria control program, and (3) request that WHO continue to provide technical assistance (re: a full time malariologist and entomologist). Some of these activities were only partially carried out while others were not done at all.

^{1/}Signed June 29, 1976.

DRAFT

For example, GOZ never officially requested WHO to provide the baseline data survey needed to evaluate later program results. A limited study was conducted almost 2 years later and according to the AID malaria advisor, contained incorrect information. Because of the lack of baseline data, the AID advisor had to rely on the limited study to decide the locations for the pilot project. In another incident, the GOZ requested WHO assistance only after the AID Mission asked the Commissaire of Health to approve the WHO technicians' arrival to allow him to enter the country. According to the WHO Country Representative, he is ready to process GOZ's requests for technical assistance but it is up to GOZ to initiate the action.

The GOZ also did not request the UNDP to provide commodities for the project. AID has provided all commodities (equipment, vehicles, insecticides, etc.) for the project.

Another example of poor coordination concerns the WHO training courses. According to USAID project advisor, GOZ has not sent anyone to WHO's French speaking training center at Lome because there were no malaria courses offered. The WHO country representative did not inform the GOZ Health Ministry of such courses taking place at the English speaking training center. Furthermore, the project advisor had to inform GOZ of a course scheduled in early October so they could send the program supervisor. He told us he also informed GOZ of a rural health education course given by WHO but at the last minute WHO cancelled it.

Coordination/cooperation with other development programs

Generally, coordination and cooperation with the malaria control project and other GOZ departments and AID's own developmental assistance programs, has been poor.

DRAFT

Cooperation has not existed between this project and GOZ's Environment Commission. The Environment Commission is responsible for general environmental clean up to promote health, i.e., anti-mosquito spraying and draining water ditches. GOZ created a committee consisting of representatives from the Environment Commission, Department of Public Works, and Department of Health to add their advice and have a plan of action. Both AID's malaria advisor and the Ministry of Health's malaria program director were asked to be on the technical advisory committee. However, it became apparent to the malaria advisor there was no technical knowledge on which to draw. The Environment Commission had no plan of action or objectives. Eventually, some mosquito spraying took place but was done hapazardly. Overall coordination was poor, very little was accomplished and eventually the committee dissolved.

Generally, GOZ departments do not hold project discussions among themselves. According to the AID project advisor the other GOZ departments could use some general project information on other internal development projects so they can "cross fertilize" each others ideas and devise an overall plan of action.

There is likewise little communication between the malaria project and other AID development assistance projects. The program advisors told us they may only find out what other projects are doing and where on an informal basis, i.e., at dinner parties and other social functions, if they ever find out at all. Currently AID management has no formal communication means addressing the possible impact of one AID project on another. Despite environmental studies done and provided to upper AID management for review, they never communicate this information downward to the project managers or advisors. Therefore, a good source of additional information with possible impact on current projects is lost to those responsible for a project's success or failure.

DRAFT

In 1960, AID Bureau for Africa requested the American Public Health Association to convene a Strategy Advisory Group consisting of leading experts in a wide disciplinary range, to help devise an anti-malaria support strategy for tropical Africa. The resulting report to AID said, among other things, that at a central level there is a need for a malaria coordination body including all ministries and other organizations which can contribute to the effectiveness of the anti-malaria program. Based on the above events, we agree with the report that a malaria coordinating body is needed to improve the overall effectiveness of an anti-malaria program.

Internal communication problems in AID's Public Health Office

There are communication problems between AID's Public Health Office and the malaria project advisors. Project advisors are not provided information concerning their project or told of meetings concerning major changes to their project.

For example, a cable request was made by the project advisors for an AID planning team to help develop a national malaria control plan based on project results. A return cable said it could not be arranged until the start of the next year. A second cable was sent requesting a January date. AID management sent a third cable saying disregard the prior cable without informing the project advisors. The advisors found out about the third cable by going through the cable traffic. They were trying to determine who sent the cable and why at the time we completed our audit. Another example concerns a management meeting to decide if the project should be terminated or extended for one year to change to a drug distribution method of treatment. An extension would allow both advisors to do further surveys, research, and training needed to change over from a mosquito control program to a drug distribution program. Both advisors feel the additional time is needed to provide adequate base level information and training to ensure success of

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the re. retrovirlogy. However, neither advisor was asked to attend this meeting and help for AID Director to make a decision. This lack of communication precludes effective program management and can only lead to problems which could have been avoided.

Coordination and cooperation between contiguous areas

AID, WHO and GOZ provided us with various comments describing coordination and cooperation between contiguous areas.

--According to AID Public Health Officer there is no government-to-government coordination regarding malaria control. Any coordination is done through WHO.

--The WHO Country Representative said the Regional Office can only recommend that countries discuss and take action to control the spread of disease. It is Zaire's responsibility to take measures to limit the spread of disease by its nine neighboring countries.

--GOZ's Secretary of State for Health said they have talks with Burundi and Rwanda regarding malaria and have meetings three times a year to discuss health, communicable diseases, cholera, diarrhea, etc. They are a member of the group of French speaking countries and meet to discuss the transmission of disease.

Based on our observations we believe very little activity occurs concerning coordination and cooperation with Zaire's neighbors to halt the influx of disease, especially malaria. Without a coordinated effort to reduce the number of imported cases of malaria, any malaria control program will only be marginally effective.

DRAFT

Conclusions and recommendations

We believe the lack of coordination and cooperation in the malaria control program presented a substantial obstacle to the effectiveness of the project. Lack of communication between interested parties and within AID, has led to problems which could have been avoided. If USAID had had better relations with GOZ's Ministry of Health, the mission could have pushed GOZ to request WHO to do the baseline study as agreed.

Therefore, we concur with the recommendation of the Strategy Advisory Group in its report to AID that a malaria coordination body consisting of interested parties (AID, WHO, host government, etc.) be established to ensure a malaria program's effectiveness. We further recommend AID management establish some formal means of communication between program advisors and upper management to ensure two-way communication of project information and related issues.

DRAFT

COUNTRY PROFILE

The Republic of Zaire is a country of striking diversity. Its 29 million inhabitants represent a rich and varied and often conflicting ethnic, religious, and cultural heritage. Straddling the equator in the heart of Africa, the nation has a synthesis of tropical climates which provides a vast insulator for numerous debilitating diseases. Morbidity and mortality particularly among children under five years of age, are excessively high due largely to parasitic and infectious diseases and malnutrition. Housing and environmental sanitation systems are inadequate. Rapid population growth is placing a substantial strain on existing health services.

Malaria is a major cause of morbidity in Zaire. Virtually the entire population is affected and repeated cases of malaria are common. Precise data on malaria infection rates for the nation as a whole are nonexistent. However, in the capital city of Kinshasa, malaria has been estimated to be as high as 50 percent in the under one-year of age group. The situation can be assumed to be worse in most of the remaining regions of the nation, given the numerous national breeding sites for mosquitos and the decreased availability of medical personnel to treat the disease once controlled.

While GOZ, USAID and WHO acknowledge that malaria is Zaire's number one health problem, there is only one small organized malaria control program. This project, consisting of 3 of the 24 urban zones of Kinshasa and a small rural area tangent to Kinshasa, was officially started in 1976 with an agreement between GOZ and USAID and a project grant for \$2.3 million from USAID. WHO was to provide technical expertise and a baseline study upon request by GOZ. At the time of its inception, the GOZ and USAID considered the project to be a model (pilot project) for eventual replication nationwide. The project's purpose was to strengthen the GOZ institutional capacity for monitoring and controlling communicable diseases. This was to be done by: (1) extension and integration of this and other endemic disease programs into the health

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delivery system and the development of a cadre of Zairian health workers competent to deal with endemic disease problems; and (2) development of an epidemiology capability within the GOZ's Department of Health for assessing, monitoring and evaluating endemic disease problems. The main technique tested during the project was domiciliary spraying with DDT for mosquito control.

The project has met its goal of establishing a cadre of Zairian health workers trained to deal with endemic diseases and reduced the incidents of malaria in the spray zones. However, there were numerous problems, some of which affect the program's integration into the health delivery system.

- Delay of initial USAID project advisors being available delayed start of the project.
- Timeliness of delivery of some commodities.
- The price of DDT per pound rose from \$.44 to \$1.44 making a national spray campaign prohibitive.
- Lack of adequately trained and experienced personnel to carry out the project made extensive training a necessity.
- Lack of adequate priority given malaria control both financially and administratively by GOZ.
- Lack of initial baseline information prohibited judging the effectiveness of program results.
- Lack of coordination and cooperation between GOZ, WHO, and USAID affected training and initial program approach.
- Lack of coordination between AID's Public Health Office and the project advisors could impact on the life of this project.

These problems will have to be addressed before a future malaria control program can be effective. We received different views concerning the future approach to malaria control, i.e., drug distribution through existing health care facilities. Both project advisors are advocating an extension of the

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current project to study the existing primary health care facilities in terms of what is available, training staff, and logistical capability. Drug resistance research would also be done to determine if current drugs are still effective. The GOZ project director said the project extension would bridge the gap between current efforts (domiciliary spraying) and drug distribution via the health care system. The Public Health Officer indicated the existing system is adequate to handle the additional drug distribution and that it is already being done to a limited extent. He is advocating terminating the current effort in 1982 and starting a new rural health project to include anti-malaria drug distribution. WHO officials felt the existing limited resources of Africa are inadequate for planned anti-malaria efforts. Malaria incidence must be at a level where primary care can control it. Malaria efforts should not be integrated into the primary care system to the detriment of malaria control. Officials said this has happened in the past and programs have failed. Agencies involved in malaria control can not afford to adopt any type of minimal holding action effort pending a break through in malaria research. If this is done, malaria will increase and be even more difficult to control.

In our opinion, AID lacks the necessary background data for integrating malaria drug distribution efforts into the existing system. More information concerning the present status of the health care facilities, staff and drug resistance is needed to ensure this new approach will be successful.

Greater priority is needed for malaria control within GOZ to make any effort more than minimally successful. Better coordination and cooperation is needed between GOZ, USAID, and WHO to ensure the necessary training and decided program approach are carried out in an effective manner. Within AID, better coordination and communication is needed between the public health office and project advisors to make use of all valuable sources of project information which could affect future program decisions.