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## MALARIA CONTROL PROGRAM ACTIVITIES

NIGER WITH AREAS FOR USAID ASSISTANCE THROUGH NHSS

# Resources for Child Health Project

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## REACH



John Snow, Inc.  
1100 Wilson Boulevard, 9th Floor  
Arlington, VA  
22209 USA  
Telex: 272896 JSIW UR  
Telephone: (703) 528-7474

**MALARIA CONTROL PROGRAM ACTIVITIES**  
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Marjorie P. Pollack, MD  
Consultant

2/16/1

The Resources for Child Health Project  
1100 Wilson Boulevard  
Ninth Floor  
Arlington, VA 22209

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## I. BACKGROUND

### A. Morbidity and mortality due to Malaria

Historically, malaria was recognized as a health problem in Niger in the middle of the 19th Century when it was described as one of the "very serious" fevers that occurred during the winter season (Henric - 1850). In 1905, it was recognized as a major cause of morbidity and mortality in all regions of the country with the exception of certain parts of the northern desert (Heckenroth).

Studies conducted in the 1960s (OCCGE - 1963 and WHO - 1968) helped define the different malaria zones in the country. The country can best be described (in terms of the epidemiology of malaria) as divided into three major zones: A Southern holoendemic zone, a Central hyper- to holoendemic zone, and a Northern mesoendemic zone.

The Southern holoendemic zone extends from the border with Nigeria up through the 500 line, an area that covers 108,500 km<sup>2</sup>, with the population representing approximately 57.2% of the total population of Niger. Parasite indices among children 2-9 years of age residing in this zone are above 83% among infants 48% and among adults 27%; transmission is increased during the rainy season when the density of A. gambiae is 69 per house and the density of A. funestus is 14.2 per house.

The Central hyperendemic to holoendemic zone is located between the 500 and 300 line, bordering the east with Lake Tchad. This area is a band

covering 150-200 km in width in the southern-sahelian climate zone with a rainy season. The area covered is approximately 170,000 km<sup>2</sup> where approximately 37.8% of the total population of Niger reside. Parasite indices among children 2-9 years old residing in this zone are 77.5%, (ranging from 66-93% depending upon the actual area of residence), among infants 20% and among adults 24.6%. Transmission is seasonal, with maximal rates in the rainy season.

The Northern mesoendemic zone is situated in a region comprised of desert and semi-desert terrain on the 300 line bordering with Libya, covering an area of 1,008,500 km<sup>2</sup>, with a population predominantly nomadic and seminomadic. Parasite indices among children 2-9 years of age residing in the zone average 27%, with the maximum registered at 52%, among infants 2.7% and among adults 10%. Transmission in this zone occurs during the short rainy season, although the population of this zone is believed to be infected during the dry season during their migration in the southern zones.

Studies conducted by WHO during the period June-November 1968 showed the malaria parasite distribution to be: P. falciparum 99.4%-99.6%, P. malariae 0.3%-0.5%, and P. ovale 0.1%-0.2%. With respect to the vectors, A. gambiae was found throughout the country, A. funestus was found in the region bordering the Niger river, A. pharoensis and A. rufipes was found in the west and central portions of the country, and A. dthali was found in the desert regions of the country. In the majority of the country, there is apparent disappearance of the vectors during the dry season.

1. Recent trends in morbidity and mortality due to malaria

Malaria is the most common health condition presenting to the health facilities in Niger, representing 16.4% of all diagnoses registered in 1984. A comparison of the relative importance of malaria as a diagnosis with other major health problems is shown below:

<u>Year</u>	<u>Malaria</u>	<u>Measles</u>	<u>Meningitis</u>	<u>Diarrhea</u>
1980				
cases	385,009	35,568	4,203	5,883
deaths	161	235	293	103
1981				
cases	394,459	36,319	2,597	5,883
deaths	151	433	187	103
1982				
cases	497,105	39,560	995	7,199
deaths	163	486	110	152
1983				
cases	378,187	27,318	1,059	8,358
deaths	102	430	75	163
1984				
cases	338,413	44,228	2,281	10,231
deaths	70	337	75	182
1985 (preliminary - may represent duplicate reports)				
cases	570,314	74,096	1,449	....
deaths	301	1,132	77	....

(....not available)

It must be emphasized that the overwhelming majority of reports of malaria from health facilities are based on clinical diagnoses of "presumptive malaria", as very few of the health facilities have been routinely confirming the diagnosis with laboratory testing. The diagnosis of presumptive malaria is made on those cases of fever associated with chills, without another clear cut explanation. At the present time, MCH facility personnel are being trained to do thick smears for malaria confirmation, but not all facilities in the country are routinely performing these tests. In addition, none of the rural dispensaries are equipped (or trained) to do thick smear confirmation of the diagnosis of malaria.

It is important to mention that reporting of "presumptive" cases of malaria is on those cases seen and treated by the health facilities in the country. In addition to the fixed health facilities, the Village Health Teams (Secouriste - First aid technician and Matron) are trained to treat presumptive malaria in their villages. Cases of presumptive malaria treated by the Village Health Teams are not reported through the Ministry of Health disease reporting system. Thus, reports of presumptive malaria are only on those cases seen by the formal health facilities, thereby representing significant underreporting of the true situation in the country, as 55% of the Nigerienne population lives within 15 km of a health facility (19% live within 5 km of a health facility applying the international definition of access to health care). Supporting this are results of a study in Dosso where 88% of patients seeking treatment at health facilities reside within 5 kms of the facility (Belge Cooperation preliminary data).

## **B. Malaria control program activities**

Malaria control activities began in 1950, when the French military based in Niger were recommending (and practicing) the use of chemoprophylaxis and the use of mosquito nets combined with antilarval control measures. Up through 1961, country program activities were directed towards the treatment of clinical cases of malaria by fixed health facilities and through general vector control measures. Beginning in 1961, there was the creation of mobile medical teams (OMNES - Organization of the Nigerienne Mobile Medicine and Sanitary Education), who assisted in the malaria control activities.

In 1962 and 1965, there were studies to evaluate the epidemiology of malaria in the country (OCCEG). In 1968, a WHO consultant team reviewed the results of the OCCEG surveys and performed an evaluation of the situation in terms of the epidemiology of the disease and the vector population in the country to complement the earlier studies (Ochrymowicz et al). In 1982, a national seminar was conducted to review the data available on studies related to malaria in the country and the technical and financial possibilities available to Niger to control malaria. In 1983, representatives from the SSP (Primary Health Care) attended an international meeting on malaria control in the context of primary health care in Lome, which was then followed by the first national seminar on the Control of Malaria in Niger held in July of 1983.

Until 1985, there was no trained malariologist in the country. During 1985 a Nigerienne physician attended a course organized by CIDESSCO

(through a WHO fellowship) and upon return to Niger was named the national coordinator of the Malaria control program.

Up through the present time, the focus of malaria control activities has been on the chemoprophylaxis of high risk populations (pregnant women and children 0-10 years of age) using 10mg/kg weight of chloroquine every fifteen days during the period July through October (the period of high transmission). In several departments, the recommended dose was 5mg/kg body weight weekly. A study in the department of Dosso in 1982 revealed that 46% of the target population participated in the first distribution of chloroquine while only 19% of the target population participated in the final distribution of chloroquine, suggesting that were difficulties inherent in the recommended strategies.

In addition to the chemoprophylaxis of high risk groups, the focus of malaria control has been oriented towards the early treatment of presumptive clinical cases of malaria with a recommended treatment dose of chloroquine at 10mg/kg body weight. Field visits have revealed that the actual treatment doses have varied from 10mg/kg up through 30 mg/kg body weight, and have varied from single dose administration to administration of the total dose split over three days. In addition, observations have been noted about the tendency of the health facilities to liberally treat malaria cases with IM Quinimax (quinine).

Because of limited resources, vector control activities have not played a major role in the malaria control activities in the country.

With respect to malarial sensitivity to chloroquine, up through the

present, there have been no reports of chloroquine resistance in the country, although there have not as yet been in vivo or in vitro studies in country. In addition, there have not been any studies to determine the optimal treatment dose for recommendation.

In 1985, there was an evaluation of the ongoing malaria control program activities with the assistance of WHO, at which time the first draft of a Plan of Action for the control of malaria in country was prepared.

With respect to vector control activities, the DHA (Division of Hygiene and Sanitation) is responsible for all activities. The DHA has two sanitary engineers, 17 sanitary technicians, 44 hygiene and sanitation agents and 9 workers. The budget established for the purchase of insecticides and larvicides in 1984 was 25,000,000 CFA, with an additional US\$ 64,700 assistance from WHO. The primary focus of the anti-vector activities has been on mosquito reduction in Niamey, comprised of the following activities: drainage and filling in of mosquito breeding sites, treatment of closed gutters with fuel oil, and intradomiliary spraying with DDT. These activities are conducted in an irregular fashion due to shortages of insecticides, larvicides and transportation. There are no data available on the activities conducted by the DHA.

Returning to the treatment of presumptive cases of malaria, the primary drug of choice used in the country is chloroquine. Chloroquine is produced in country by the ONPPC (National Organization of Pharmaceutics), with importation of raw materials from European suppliers. The importation of raw materials is exempt from taxation. All chloroquine tablets

administered by the VHTs are sold at a price of 5 CFAs per 100 mg tablet. Up through the present, all chloroquine distributed by the health facilities has been free of charge. The VHWS can purchase the chloroquine from the regional pharmaceutical depots, or from the health facilities nearest to them.

Upon questioning, the ONPPC has production capabilities to produce all estimated chloroquine needs for the country. In addition to the chloroquine produced by the ONPPC, Quinimax injectable is imported, as is Fansidar in injectable and tablet forms. Observations in the field have revealed that at times, failure to respond to chloroquine therapy or "severe" cases (associated with vomiting) are often treated directly with Quinimax or Fansidar, without referral to secondary or tertiary centers for further diagnostic studies.

A review of the quantities of antimalarial agents used in Niger during the periods 1984/1985 and 1 October 1985 - 20 May 1986 are presented on the following page (page 8-A) (These data were furnished by the ONPPC. These data do not include antimalarial agents that have been donated to the country as they are controlled by another division).

Of importance to mention is that the ONPPC is a parastatal organization that has full responsibility for the importation of all drugs and biologics into the country. In addition to the importation of drugs and biologics, there is national production of selected drugs, one of which is chloroquine, another is aspirin. The ONPPC is responsible for the distribution of all drugs.

Until recently, drugs were distributed by the central level of ONPPC to 16 pharmaceutical depots, located in the departmental capitals and in selected arrondissement headquarters. Plans are underway for increasing the number of popular pharmacies in rural areas to assist in the expansion of access of pharmaceuticals.

## II. ANALYSIS

### A. Problems and GON response

#### 1. Malaria as the leading cause of morbidity seen by health facilities

As mentioned in the background section, malaria is the leading diagnosis reported by the health facilities in the country annually, with an average of 380,000 cases reported each year (during the period 1980-1984), representing an annual reported incidence of approximately 5.8% (583 cases per 10,000 population). It must be remembered that information on malaria cases is based primarily on reports of presumptive cases (fever without other clear diagnostic explanation) seen at the health facilities, and only 19% of the Nigerienne population lives within easy access of a health facility (within a 5 km radius).

Thus, there is a gap in information on the true level of disease burden caused by malaria in the country due to lack of confirmation of presumptive cases and lack of reporting from rural areas distant from health facilities.

Information available on the mortality due to malaria is limited. While annual reports are of approximately 150 deaths due to malaria, it must be remembered that current estimates are that only 10% of all deaths in Niger are reported through the mortality reporting system. A household based survey on morbidity and mortality among the less than five year old population conducted in 1985 revealed that 31.4% of children had had a febrile illness in the two week period preceding the survey. The overall mortality among children born in the five year period preceding the survey was 267 deaths per 1000 live births. Of the reported deaths, 22.1% were associated with a febrile illness alone (presumptive malaria), representing a cause specific mortality rate of 59 per 1000 live births. This was the leading identified cause of mortality in the less than five year old population. When mortality was looked at by geographic zone of residence, febrile illness was associated with 64 deaths during the first five years of life per 1000 live births in rural areas as compared with 30 deaths during the first five years of life per 1000 live births in urban areas.

Recognizing that there are difficulties inherent in the data collection system, but that evidence suggests that malaria is a major cause of morbidity and mortality especially among the childhood population, in 1985, the GON began work on the development of a national program directed at the reduction of mortality due to malaria in the

country. The decision to target activities at mortality reduction was based on internationally available information suggesting that morbidity reduction, given the present technology was not feasible and in fact could be detrimental to the future success of mortality reduction efforts. It has been well recognized that a program directed at mass chemoprophylaxis of the population (with chloroquine) can be detrimental. Observations in Niger and in other countries have shown that population compliance with chemoprophylaxis drops off markedly following the third month of initiation of the drug regimen. The widespread use of incomplete suppressive dosages in the population is felt to increase the probability of development of chloroquine resistance among the P. falciparum, thereby resulting in more treatment failures, with an increase in mortality associated with the introduction of chloroquine resistance into an area. In addition, successful chemoprophylaxis of the childhood population results in cohort of adults who have not developed partial immunity to the P. falciparum, with resultant increased susceptibility of the adult population to more serious malarial illness once infected.

In response to the problem, the GON has designated a national coordinator for the control of malaria program and is in the final stages of preparation of a national Plan of Action. As mentioned, the focus of the Plan of Action is to reduce the mortality due to malaria through rapid, radical treatment of presumptive malaria cases. In addition, recognizing that malaria infection of pregnant women is related to an increase in stillbirths, spontaneous abortions and low birth weight infants (at higher risk of fatality during the first year of life), the GON Plan of Action includes the chemoprophylaxis of

pregnant females. Under discussion for approval is the approach to vector control in terms of malaria interventions. It is well recognized by the technicians that a vector control program directed towards the eradication of malaria is not cost effective at present. Vector resistance to insecticides has been well documented internationally, with second and third line insecticides much more costly. Estimates are that the annual cost would be approximately US\$ 9 per capita for such a program. In addition, the lack of commitment of neighboring countries towards eradication of the vector leaves a situation where there would be continued reinfestation from other areas...a "no win" situation. Technical assistance from a WHO malaria expert recommended that a cost feasibility study on vector control options should be performed before committing to such an approach.

At present there are plans to have a limited vector reduction program for the major urban center of Niamey, including a health education program for assistance with breeding site reductions.

To improve information on the true morbidity and mortality burden of malaria in the country, there are plans for training of sentinel health facilities in laboratory diagnostic skills (at the departmental and arrondissement levels), and to include reports on presumptive malaria cases treated by the VHTs.

## 2. Lack of uniformity in treatment of presumptive malaria cases

As mentioned previously, observations in the field reveal that in practice there is no standard observed treatment regimen for presumptive

malaria cases seen by health care personnel. Treatments vary from 10mg-30mg/kg body weight given in single dose or divided over the course of three days. In some areas, when chloroquine supplies are decreasing, the doses are cut to 5mg per kg body weight or less. The absence of uniformity in dosage treatment may lead to partially treated infections, a situation which is felt to increase the risk of development of chloroquine resistant falciparum in an area.

To address this problem, in vivo studies have begun in order to identify the appropriate treatment regimen for Niger, investigating 10mg/kg body weight in a single dose administration. Preliminary findings suggest that this is an effective dose regimen.

In addition to the nonuniformity of dosage of chloroquine practiced, there is also the practice to use non-chloroquine anti-malarial agents somewhat indiscriminately. In addition, those patients presenting with vomiting associated with the febrile episode, often a single intramuscular injection of Quinimax is administered. (Quinimax should be administered four times a day to be effective in the treatment of malaria; in addition, permanent paralysis in injected limbs with intramuscular Quinimax has been well documented). In many areas, recurrence of fever is automatically treated with Quinine or with Fansidar, assuming chloroquine resistance without further evaluation of the patient to either document chloroquine resistance or alter the diagnosis of the febrile illness. Recognizing the dangers inherent in the indiscriminate use of non-chloroquine anti-malarials (development of resistance to Fansidar with resultant loss of second line drugs for the eventuality of chloroquine resistance), the GON is reviewing several

policy options. One critical policy is the removal of non-chloroquine antimalarials from the primary health attention level, with their availability only at secondary levels equipped with the capability to study chloroquine resistance and to further evaluate the clinical illness for other possible causes of febrile illnesses. All presumptive cases of malaria treated by VHTs, dispensaries and medical posts which do not respond to chloroquine 10mg/kg body weight will be referred to the next highest level of attention where these cases will be treated with intravenous quinine perfusion and chloroquine when indicated. To monitor the possible introduction of chloroquine resistance, sentinel health facilities will be established for monitoring through in vivo studies on cases treated.

The development of the national surveillance for chloroquine resistance will include the hospitals and medical posts in each department (at least one per department - including departments in each of the three identified different malarial zones).

### 3. Lack of trained personnel to implement malaria control strategies

At the present point in time there is only one trained malariologist in the country. As part of the country Plan of Action, there is an inter-ministerial technical advisory committee which is reviewing the Plan of Action, but the malariologist is working alone in the development and implementation of the activities described in the Plan of Action. There is the need to train additional personnel in country to assist with malaria control activities.

As part of the Plan of Action, malaria control strategies will be introduced into the health care personnel training curricula. In 1986, material was introduced into the medical curriculum as well as the nursing curriculum, with three degree, theses produced by graduating nurses on related operational issues.

At the level of the Departmental health facility, most departmental medical centers have the capability to read malaria thick smears for positivity, but none are trained to do parasite counts on the smears (a necessary procedure for in vivo studies).

In order to assist with the retraining of health care personnel in the appropriate therapy and chemoprophylaxis strategies to be used in the malaria control program, there will be the preparation of guidelines for distribution to all levels of attention. In addition to the preparation of guidelines for distribution to all levels of attention. In addition to the preparation of guidelines, there are plans to have training sessions for each level of health care worker in the appropriate strategy, given the level of attention. This will include the retraining of VHTs.

4. Recurrent costs incurred through the chemoprophylaxis and the early treatment of presumptive malaria cases.

As mentioned previously, chemotherapy for presumptive chloroquine is presently provided free of charge from the the health facilities, while chloroquine received from the VHTs are sold at a cost of 5 CFA per 100 mg tablet. Recognizing that the implementation of an effective

control program will greatly increase the costs due to a greater outreach for early identification of presumptive cases with rapid and radical therapy, the GON has taken the policy decision that chloroquine will be sold at all points in the distribution network. Because of increases in production costs, the ONPPC is recommending that the tablets be sold at 6 CFAs per 100 mg. (Distribution costs have also increased in the preceding year) Proceeds of the sales of chloroquine each year will finance the following year's production of the drug.

The second line drugs (quinine and Fansidar) are imported and will be restricted in their distribution (under the new policy) but no cost recovery scheme for their use has been proposed as yet.

#### **B. What is feasible in the next five years**

The Plan of Action has a specific objective to treat 50% of all febrile episodes (as presumptive malaria) with chloroquine. The current estimates are, that there are approximately 8,000,000 febrile episodes in the country annually. In addition, there are plans to treat 150,000 pregnant women with chemoprophylaxis (this represents an estimated 50% of the population of pregnant females in the country).

A review of the Plan of Action proposed for the implementation of malaria control activities reveals that many of the proposed activities have been implemented, pre-finalization of the Plan. Thus, course material has been included in the health care personnel curricula (Medical and Nursing); in vivo studies have begun in order to identify the appropriate treatment regime for the radical cure of malaria episodes; and plans are

under way to identify sentinel facilities to include in surveillance of chloroquine resistance.

Given the level of effort already demonstrated by the program coordinator and the Technical Advisory Group, it seems fair to predict that coverage targets can be achieved during the five year period. Constraints to achievement of the targets relate to constraints of limited access of the population to health care providers for the treatment of malaria episodes. As discussed elsewhere, 19% of the population resides within a 5 km radius of a health facility; 55% within a 15 km radius of a health facility; and an additional 19% reside in villages greater than 15 kms from a health facility that are covered with VHWs. Estimates of what proportion of malaria cases actually occur among populations within access of the health facilities is not available. Because of the limited access to services, the importance of the health education component of the program cannot be over emphasized. The population will have to be sensitized to seek the services of a health care provider for presumptive malaria episodes.

With respect to the attainment of targeted coverages of the pregnant women, again the importance of the health education activities cannot be understated. Drawing from the experiences in many countries, the problems to be overcome include the continued compliance of the target population once captured by the program (continuation of chemoprophylaxis during the entire term of the pregnancy) and the original capture of the target population. Within other program activities such as immunizations, success in the capture of pregnant women for preventive health interventions has been less than optimal. Coverages of the population with prenatal services

remain low, with the majority of pregnancies not coming to the attention of the formal health sector, especially for preventive interventions. Given this background information, one possible strategy to be considered for the health education activities is to include malaria intervention messages as part of a health communication project as proposed for EPI activities, diarrheal disease control program activities and for family planning activities.

Another possible constraint for the achievement of the stated targets relates to the distribution and availability of chloroquine, especially in rural areas. At present, there are ONPPC depots in each of the Departmental capitals and 18 popular pharmacies in the country located at the arrondissement level. Village health teams that are unable to access the depots for purchase of chloroquine can purchase their supplies directly from the rural dispensary nearest to their village (usually the rural dispensary with responsibility for the supervision of the VHT). There are plans to increase the commercial sale of pharmaceuticals in the country through the establishment of additional local outlets in an attempt to expand the distribution network into the rural areas. If these plans do not occur during the five year period, the unavailability of chloroquine at the "end of the line" may be a constraint to the achievement of the stated goals.

With respect to proposed training targets, given the level of assistance targeted for the Malaria control program activities over the period 1986-1990, the plan appears feasible. The major constraint to the achievement of the goals may be the limited personnel available. At present there is only one trained Nigerienne malariologist, with

responsibilities for the planning and implementation of all program components. The addition of trained laboratory technicians to the cadre of TA should facilitate the achievement of the proposed training schedule for the implementation of the in vivo studies and for the implementation of the surveillance of chloroquine resistance activities.

In summary, should all proposed assistance be provided, the GON targets for coverage of the population with malaria control activities aimed at the reduction of mortality due to malaria in the country are feasible during the next five years.

### III. OTHER DONORS

#### A. World Bank

The World Bank has just signed an agreement with the GON to provide assistance in the health sector through an IDA loan to assist in the introduction of structural reform in the health sector. This will be done through studies and reform programs aimed at improvements in investment planning, the allocation of recurrent expenditures, cost recovery, the availability of essential drugs, sector management and aid coordination. The project will improve the efficiency of priority health programs: (1) maternal and child health care including family planning, control of malaria, diarrhea and other communicable diseases; (2) health education and community initiatives in health and nutrition, and (3) training of health personnel. (World Bank Staff Appraisal Report - February 26, 1986).

With respect to assistance within malaria control activities, the

project will be providing approximately US\$ 1.6 million. The World Bank project will provide: (1) an initial stock of chloroquine that will cover the estimated needs of the population for one year; with replenishment of the chloroquine stock secured through revenues from its sale; (2) laboratory equipment to improve diagnostic capacity in three selected medical centers; (3) fellowships to train one entomologist and one sanitary engineer for program implementation; (4) support for community education and staff training in malaria; and (5) logistical support for supervision and monitoring of activities. (World Bank Staff Appraisal Report - February 26, 1986 page 14). With respect to technical assistance, the project will provide one month of TA during the first year of the project to assist with the design of a cost feasibility studies of vector control activities.

Given the level of financial assistance to the malaria control activities, it is fair to conclude that the World Bank is taking a lead role in this field. A detailed implementation plan for the assistance to the malaria control program activities was not available to this consultant for review. A review of the proposed country Plan of Action for malaria control activities reveals that most of the defined activities in the plan have been targeted for assistance through the World Bank project.

## **B. WHO**

A review of the proposed country plan of action for malaria control reveals that it is planned for WHO to provide assistance with fellowships for the training of entomologists to assist in the development of an appropriate strategy for vector control activities. The WHO country

representative has newly arrived in country (April) so the future assistance within malaria control activities has not as yet been determined. It can be assumed that assistance will be available through the provision of TA for training and evaluation activities based on WHO support in other countries. A review of the 1986 WHO Niger budget revealed that there is no individual line item for malaria control activities.

### **C. Belgian Cooperation**

The Belgian Cooperation has been providing assistance primarily within the field of operational research related to Primary Health Care service delivery. The coverage of the population by health facilities and VHWs are two areas of research that relate to the proposed malaria activities. In addition, there is a Belgian physician working with the MOH as a technical advisor who is also a member of the interministerial technical advisory committee for the malaria control program.

### **D. USAID**

Through the rural health improvement project (RHIP), assistance has been provided for the training of the Village Health Teams and the improvements in the information systems related to health care delivery (HIS and MIS). As part of this assistance, a nationwide morbidity and mortality survey was conducted in 1985, providing information on selected causes of morbidity and mortality, health services utilization and selective coverages. Direct assistance to malaria control activities has not been provided as yet. Indirect assistance to malaria control activities was provided through the training of the VHWs in the

identification and treatment of presumptive cases of malaria, and the results of the morbidity and mortality survey which provided the first population based data on the occurrence of presumptive malaria in the childhood population since the initial parasitemia studies done in the 1960s.

Malaria control is considered one of the activities identified as part of the overall child survival strategy interventions for the reduction of morbidity and mortality by USAID. The focus of USAID assistance in the child survival activities has been through the provision of TA for the various selected intervention strategies. The proposed assistance through the NHSS has an emphasis on policy reform in the health sector that will result in improved efficiency of health care delivery and increased coverages of the population with preventive health measures. Assistance within malaria control activities will be directed at the provision of TA to aid the MOH in the development of training materials, training of laboratory personnel to implement surveillance activities for chloroquine resistance and to improve the diagnostic capacity of the health facilities, and for the evaluation of program activities. Other donor assistance is oriented towards assistance in commodity procurement and distribution, with just small amounts of projected TA. Thus, there is no apparent conflict of interests in the proposed assistance. Given USAID's demonstrated strength in this area, assistance is justified and welcomed by GON/MOH officials. It must be mentioned that the process of identification of potential areas for USAID assistance revealed that most projected components of the Plan of Action may be covered through the World Bank project with the exception of TA. The MOH officials felt strongly that additional TA would facilitate the implementation of planned activities and

would assist in assuring the planned targets were met during the proposed five year funding period.

#### IV. CONDITIONALITY

The only definable conditionality of funding for malarial control activities under the World Bank support is that the GON will, through the intermediary on ONPPC, establish an account in a commercial bank to operate the revolving fund for the replenishment of chloroquine. (World Bank Staff Appraisal Report, February 26, 1986 page 14).

There are no defined conditionalities for support through the WHO or Belgian cooperation assistance plans with respect to malaria control activities.

Given the level of support to be provided to the malaria control activities by the World Bank in terms of commodity procurement and supervisory activities, and the dependence of the program upon the receipt of this assistance for the implementation of the activities, it does not appear justified for USAID to place conditionalities upon disbursement that are dependent upon other donor agency assistance.

Once the results of the feasibility study for vector control activities are available, should the results confirm the present international recommendations not to invest too many resources in vector control activities it would be justified for the NHSS not to provide assistance in major vector control program components.

## V. SUGGESTED INTERVENTIONS FOR USAID IN MALARIA CONTROL PROGRAM ACTIVITIES

### A. Technical assistance

#### 1. Preparation of guidelines for activities directed at the control of malaria in Niger

The MOH/DSS has requested the assistance of a Malaria expert (preferably from the CDC) to participate in the national seminar planned for the development of country guidelines for the diagnosis, chemotherapy and chemoprophylaxis strategies as part of the control of malaria program activities. The seminar is planned for early 1987. It is estimated that one month of TA would be required for the activity. The purpose of the national seminar is the preparation of guidelines for use in the training of health care personnel in the necessary activities required as part of malaria control.

#### 2. Training and retraining of health care personnel

The MOH/DSS has identified as a potential area of USAID assistance, the training and retraining of health care personnel in the strategies for malaria control as defined in the Plan of Action. Technical assistance is projected for the preparation of the training materials and to assist in the actual training sessions. One to two months of TA are estimated and would be required during the latter part of 1987.

### 3. Training of health care personnel for in vivo sensitivity studies:

The MOH/DSS has requested USAID for assistance in the training of the necessary health care personnel (physicians, nurses and laboratory technicians) in appropriate procedures for in vivo sensitivity testing (for the implementation of the surveillance activities to monitor for the possible introduction of chloroquine resistance). This assistance would be in the form of two to three long term advisors, trained laboratory technicians who would assist in the in-service training of personnel in the laboratory aspects of in vivo sensitivity testing. Preliminary discussions were held with both the MOH and the Peace Corps Niger director on the feasibility of recruiting PCVs to assist in this component. It is envisioned that the PCVs would spend several months in Niamey to assist in the training of personnel in the main health facilities to serve as sentinel units, and would then be displaced to assist in the training of departmental level personnel. Approximately two to three weeks in each departmental headquarters for the in service training of personnel is estimated. Once the training of all departmental level personnel is completed, if time is available, selected arrondissement level personnel will be trained.

In service training of laboratory techniques is preferable to conducting a classroom type workshop as it will permit a verification of capture of the techniques by the personnel. Quality control of the testing procedures is imperative to monitor chloroquine sensitivity in

the country. The proposed assistance fits nicely within the mandates of Peace Corp and would greatly facilitate the implementation of the Plan of Action for malaria control program activities.

#### 4. Information system

The MOH would like assistance for the development of an information system that would permit the routine monitoring of ongoing activities in malaria control as well as the disease burden (an epidemiological surveillance system). As the Tulane project has been working with the MOH on the improvement of information system activities, this could be included as part of the Tulane project. Types of information necessary include the number of presumptive cases of malaria treated by type of health care provider, including the VHTs; proportion of presumptive malaria cases confirmed through laboratory testing, mortality due to presumptive malaria, age specific morbidity and mortality monitoring, and MIS data for chloroquine distribution.

#### 5. Coverage surveys

In order to follow the progress of the implementation of the malaria control activities, periodic coverage surveys are indicated to assess the proportion of "presumptive malaria" episodes treated with chloroquine. As coverage surveys are planned for EPI activities and for the diarrheal disease control activities (coverage of diarrheal episodes with ORT), it is envisioned that information on the treatment of febrile illnesses could be included in the same survey, rather than

the design of separate surveys for each health intervention strategy. In addition to the collection of information on the treatment of febrile illnesses with chloroquine, reasons for non use of the health care services for treatment should be solicited and information obtained should be used for the modification of strategies to ensure increased coverages with the intervention.

## **B. Training**

As discussed above, USAID assistance with short and long term technical advisors for the development of training materials to be used in the training of health care personnel in the appropriate activities related to malaria control has been requested. Long term advisors in the field as in service laboratory technician trainers has been requested as the only Nigerienne trained in these procedures is the malaria control program coordinator who has responsibilities for overseeing all aspects of the implementation of the Plan of Action. In the absence of this assistance in the training activities, the implementation of many of the components of the program will be delayed due to the personnel constraints.

## **C. Research**

The MOH has requested USAID assistance in the planning and implementation of epidemiologic studies in the different malaria zones in the country to better define the epidemiology of the disease in the country, recognizing that the most recent information available is from studies performed in the 1960s. A minimum of six weeks of TA for these studies is planned, preferably in the second year of the project.