Vector Biology
and Control Project

MALAWI

Promoting Health Interventions For Child Survival (PHICS)

Project Paper No. 2 — Malaria Component

July 1992

by

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VBC Report No. 82151

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The authors traveled to Malawi in July 1992 through the coordination of the Vector Biology and Control Project, under contract No. DPE-5984-Q-00-9031-00 to Medical Service Corporation International, Arlington, Virginia, for the United States Agency for International Development, Office of Health, Bureau of Research and Development.

Acknowledgements

The authors wish to express their appreciation to USAID/Malawi Mission Director Carol A. Peasley, HPN Chief Christopher McDermott, and Mission staff members Mexon Nyirongo, Bobbi Thami and Jeannie Wong for their active collaboration in the investigations and deliberations of the team's visit to Malawi and the preparations of these findings and recommendations. The assistance of the Ministry of Health of the Government of Malawi, especially the untiring efforts of Dr. Lester Chitsulo of the Community health Sciences Unit, was essential to our work and is gratefully acknowledged, as are the hospitality and time of the individuals, too numerous to mention here, from both public and private sectors, who shared with us their insights into malaria control in Malawi during our visit.

INSERT PAGES:

PROJECT DATA SHEET

ACTION MEMORANDUM TO THE MISSION DIRECTOR

PROJECT AUTHORIZATION AMENDMENT

PHICS
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List of Acronyms

CDC	Centers for Disease Control (U.S. Public Health Service)
CDD	Control of Diarrhoeal Diseases
CHAM	Christian Health Association of Malawi
CHSU	Community Health Sciences Unit
CHV	Community Health Volunteer
DHO	District Health Officer
GM	Government of Malawi
HIS	Health Information System
HSA	Health Surveillance Assistant
IST	In-Service Training
KAP	Knowledge, Attitudes, and Practice (type of survey)
LSHS	Lilongwe School of Health Sciences
MOH	Ministry of Health
MOLG	Ministry of Local Government
NMCC	National Malaria Control Committee
NMCP	National Malaria Control Programme
NGO	Non-Governmental Organization
PHC	Primary Health Care
PHICS	Promoting Health Interventions for Child Survival Project
PHN	Population, Health, and Nutrition (section of World Bank)
S-P	Sulfadoxine-Pyrimethamine (combination drug)
TA	Technical Assistance
VSO	Voluntary Services Organisation

PHICS PROJECT PAPER SUPPLEMENT #2
MALARIA COMPONENT

I. EXECUTIVE SUMMARY

As the problem of malaria in Malawi becomes more and more serious, the malaria control program must evolve. The gains made to control other diseases have not been realized for malaria. The percentage of children presenting to health facilities with malaria is increasing, as is the proportion of under fives hospital admissions due to the disease. Chloroquine can no longer be used with confidence for either the prophylaxis or treatment of falciparum malaria. A series of careful studies led to a decision by the Ministry of Health to replace chloroquine with sulfadoxine-pyrimethamine[1] (S-P) as the recommended drug for first line treatment of uncomplicated malaria in Malawi. Studies are in progress to determine how the prophylaxis policy should be changed, and there is growing interest in bednets impregnated with insecticide for personal protection.

As the first African country to change its official treatment protocol so definitively, it is essential that Malawi implement the transition carefully, monitoring the consequences systematically and making adjustments as needed. A sustained, coordinated effort will be required. In addition, operations research is needed in combining a variety of strategies, one of which, barrier protection through the use of impregnated bednets, looks particularly promising.

In the progression from applied research -- searching for a better control strategy when chloroquine proved to be ineffective -- to the implementation of the new strategy, the actions needed converge with the aim of the Promoting Health Interventions for Child Survival (PHICS) Project: building health system capacity to diminish childhood morbidity and mortality. Significant PHICS resources have already been directed to malaria control, but more comprehensive assistance is needed at this critical point. This amendment has been designed to provide such assistance to the National Malaria Control Programme.

This amendment recognizes four essential components for an effective malaria control program in Malawi -- appropriate case management, prevention, reinforced primary health services, and monitoring and policy guidance. Malawi has developed a strong research capability to guide its malaria control policies, and impressive gains have been made in the understanding of malaria control. The natural evolution of the program is to focus now on how those research findings can be applied to improve health services for Malawians. The significant change represented by this amendment to the PHICS Project is the provision of assistance to Regional and District Health Teams to improve implementation of malaria control in their areas. Emphasis will be placed on strengthening the capacities of the District Health Team and its activities that reach out to the health centers and communities. The focus of this support will be improved malaria control, but the capabilities developed will

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[1] More commonly known by its trade name Fansidar.

strengthen the capacity of the peripheral health system to provide a package of essential health services. The development of separate vertical structures will be avoided. Personnel within the system will be encouraged to participate in finding new ways to provide better services.

Not all 24 Districts will participate in every activity of the program. Districts already targeted because of their poor infant health statistics for special attention by the PHICS Project will receive particular attention. Collaboration with NGOs will be promoted, particularly at the level of the District health management team. Because government health services are sometimes less flexible than the private sector in testing new approaches to service delivery and its management, PHICS will provide limited support to such private organizations.

The strategy of this PHICS amendment is to provide funding to accomplish the following:

1. **Promote an approach to malaria control in Malawi which balances research and service delivery, expanding responsibility for malaria control to include health service providers at all levels.**

A second locus of malaria control management should be established within Ministry of Health headquarters to strengthen service delivery. The result will be two program foci -- one within CHSU for scientific expertise and policy development, the other in the "line" staff for the development of malaria prevention and treatment capabilities. One person will be designated within the service delivery hierarchy of each region to be the malaria program manager. Together, the three regional managers and the two national level managers (from service delivery and CHSU respectively) will constitute the Malaria Program Management Team. Reorganization of essential personnel to permit this will be a condition precedent to the amendment.

Greater resources and responsibilities will be given to health personnel at regional, district, and peripheral levels, and NGOs will be incorporated into the District teams and provided extra funds. The malaria research agenda will be focused to guide the delivery of services that can reduce morbidity and mortality, particularly among children and mothers.

2. **Support continued applied research by CHSU, primarily through the Mangochi research station, to guide the malaria control policies in Malawi.**

The existing facilities/capabilities of CHSU at the Mangochi Research Station will be expanded, integrating to the extent possible with the District Hospital Laboratory and the Community Medicine program of the Malawi Medical School. Funding will permit a modest laboratory expansion, procurement of basic equipment, operating expenses on a decreasing schedule, salary support on a decreasing schedule for core laboratory staff, the training of an entomologist, and support for selected applied research.

3. Reinforce health service delivery within Malawi to facilitate malaria prevention and treatment by strengthening the capacity of regional, district, and peripheral health teams to commit greater resources to malaria control at the service provider level.

In addition to the malaria program management adjustments described above, support will be provided to the MOH in certain critical areas as well as to Districts. Central support will include assistance for:

- training curricula and materials (may include short term TA);
- health education approaches (may include short term TA);
- information dissemination (newsletter every 6 months);
- quality control of laboratory services at district level; and
- routine monitoring at specified sites and levels for resistance to drugs, drug side effects, possible treatment failures, and referrals.

A yearly contest for best new malaria control ideas will encourage operations research.

District level funding will support:

- in-service training;
- health promotion and community education;
- monitoring and supervision;
- operations research at peripheral levels to find improved ways of promoting and managing malaria control activities (e.g. bednets or chemoprophylaxis for high risk groups).

4. Provide special funding for NGOs working at district and more peripheral levels to develop new approaches to malaria prevention and control.

This will permit operations research in the promotion of insecticide impregnated bednets, local financing of health services, and the development of new approaches to training, health education, supervision, monitoring, and community participation.

5. Support the design and implementation of a national campaign to introduce Sulfadoxine-Pyrimethamine (S-P) as the first line drug for treatment of presumed malaria in Malawi.

Technical assistance, management support, and funding will be provided to plan and execute a coordinated "launch" of this new product, including a public education campaign using mass media, a health worker campaign to train health workers in proper diagnosis and treatment, and a special management effort to assure that necessary stocks of S-P are widely available for the launch. A private sector marketing or management firm will be contracted to design and coordinate the launch with technical advice provided by the Ministry of Health and the National Malaria Control Committee.

Illustrative budgets are provided for the various activities, some of which may already be available under PHICS funding.

PHICS PROJECT PAPER SUPPLEMENT #2
MALARIA COMPONENT

II. PROJECT AMENDMENT DESCRIPTION

A. INTRODUCTION

Malaria control in Malawi is evolving. The 1980s witnessed the gradual spread of chloroquine resistance to the point where it can no longer be used with confidence for either the prophylaxis or treatment of falciparum malaria. A series of careful studies documented this development, culminating in the decision by the Ministry of Health, in October 1991, to replace chloroquine with sulfadoxine-pyrimethamine[2] (S-P) as the recommended drug for first line treatment of uncomplicated malaria in Malawi. Studies are in progress to determine how the prophylaxis policy should be changed, and there is growing interest in bednets impregnated with insecticide for personal protection.

As the 1 October 1992 target date for the changeover from chloroquine to "S-P" approaches, new treatment guidelines are being prepared, a modest health education plan to introduce the changed policy has been drawn up, and drugs have been ordered. Over the next few months a thorough-going change must occur in the treatment strategy for the most important disease in Malawi -- with the possible exception of AIDS, for which no effective treatment exists. As the first African country to change its official treatment protocol so definitively, Malawi bears the responsibility to implement the transition as properly as possible, monitoring the consequences systematically and standing ready to make programmatic adjustments as needed. A sustained, coordinated effort will be required.

At the same time that drug policies are changing, serious interest in malaria prevention is growing. As malaria treatment and chemoprophylaxis have become increasingly problematic, the interests of the public health community is turning to integrated approaches combining a variety of strategies. One of those, barrier protection from the vector Anopheles mosquito through the use of bednets or curtains, looks particularly promising, especially when impregnated insecticide to kill and repel insects.

In the progression from applied research -- searching for a better control strategy, the former chloroquine strategy having proven to be unreliable even when applied assiduously -- to the implementation of the selected new strategy or strategies, the types of activities that are required converge with the aim of the Promoting Health Interventions for Child Survival (PHICS) Project: building health system capacity to diminish morbidity and mortality from a variety of diseases threatening child survival, malaria prominent among them. Significant PHICS Project resources have already been directed to malaria control, but more comprehensive assistance is needed at this critical point. It is to the programming of new activities and resources in support of the National Malaria Control Programme that this amendment has been prepared.

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[2] More commonly known by its trade name Fansidar.

B. BACKGROUND

1. Evolution of the Malaria Control Program

The development of any diseases control program is a circular process, which initially relies on research to generate the findings needed to formulate the program's policies. The policies can then be implemented through the general health services after marshalling the needed resources. Policy implementation must be monitored and supervised to assure correct implementation. Subsequent evaluations will highlight areas in need of operational and/or applied research that can lead to revision of policies. This leads to changes in implementation and the process goes round and round.

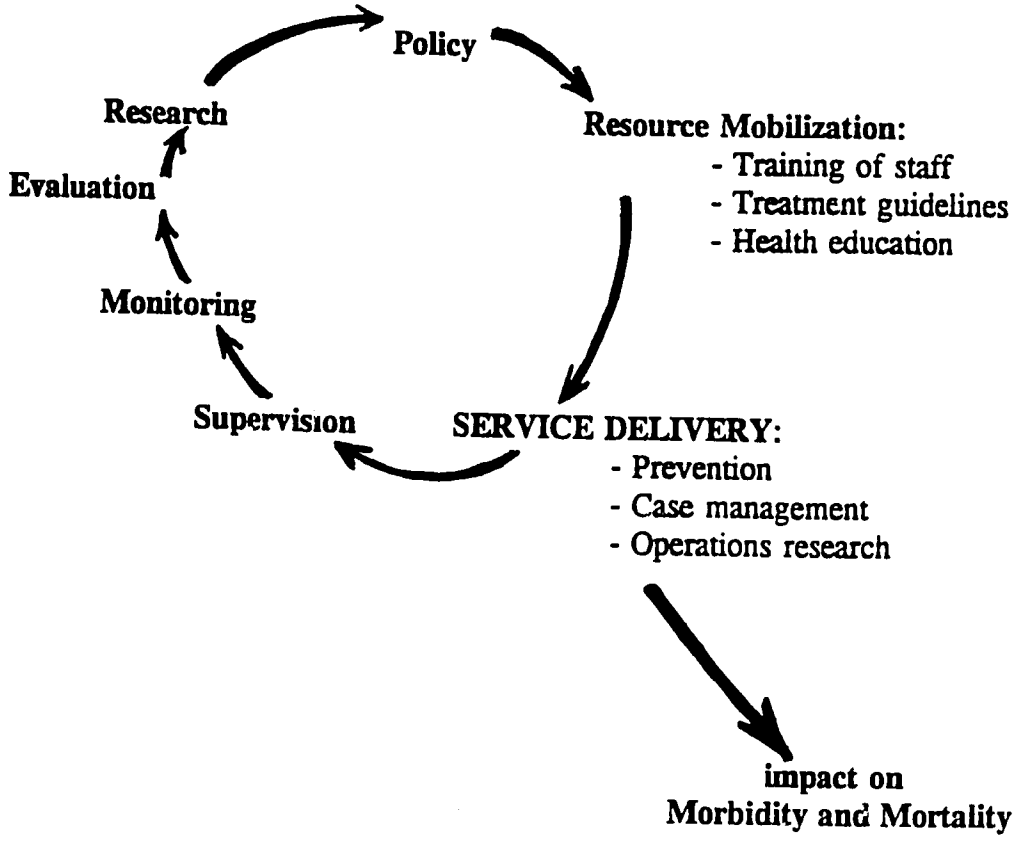


Figure 1. **Natural Evolution of a Malaria Control Program**

If Figure 1 can be considered to represent the malaria control program in Malawi, recent

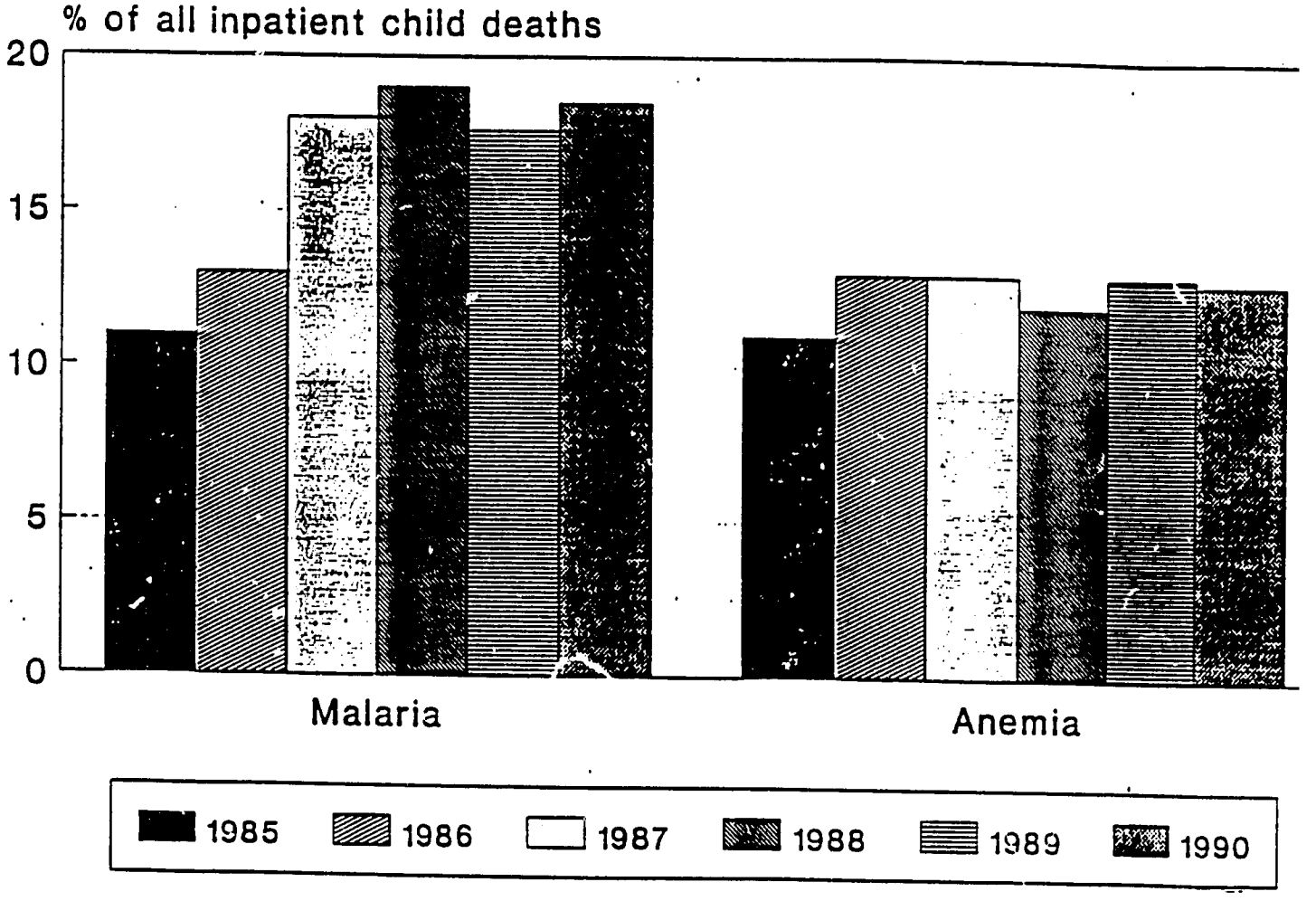
years have seen a heavy emphasis, in terms of resources and interest, on the research aspect. Monitoring and evaluation of the previous policy indicated that it did not work satisfactorily. To pour scarce resources into implementation of an ineffective intervention would have been unconscionable: a better strategy had to be found. This the MOH achieved through research carried out in collaboration with the Centers for Disease Control using funding from USAID. The new strategy that resulted is the systematic use of sulfadoxine-pyrimethamine as the drug of choice for malaria treatment.

It is now time to advance to the implementation phase while monitoring the effectiveness of the policy change in helping to reach our goal -- the reduction of morbidity and mortality, especially in children and their mothers. It is time to implement the new policy aggressively by educating the people of Malawi, from the health personnel in Lilongwe to the shopkeeper in Thyolo to the mother in Kaporo, on the replacement of chloroquine by S-P and the correct dosages to use. Equally important is to use this opportunity to convince health workers at all levels and the population at large that something can be done to reduce the morbidity and mortality caused by malaria, that controlling malaria is not a hopeless task.

It is with this broader mandate that the NMCP must be concerned. The second Five-Year National Plan for Malaria Control in Malawi (1990-1994) calls for a reduction in the morbidity and mortality due to malaria by strengthening malaria control within the general health service delivery system. This can only happen if the services delivery components of the malaria program are significantly improved and better balanced among research, policy development, service delivery and monitoring/evaluation.

2. Malaria in Malawi: A child Survival Problem

An estimated 3.5 million cases of malaria occurred in Malawi in 1990. Malaria accounted for 36% of all visits to health care facilities, and 40% of those visits were children under five. In 1989 it was reported that 18% of all hospital deaths that occurred in children under five were due to malaria. Between 1985 and 1988 the number of hospitalized malaria cases increased 41% from 17,589 to 25,155. Figure 2 presents trends in child mortality due to malaria and anemia between 1985 and 1990. During the same period malaria accounted for an increasing proportion of admissions among under fives. The case fatality rate for cerebral malaria is about 30 percent for children under five and almost 20% even in the best equipped facilities. When severe anemia, much of which is considered to be due to malaria, is combined with malaria cases, the two groups account for 42% of all under-five hospital admissions and 30% of all in-hospital deaths.



(Source: Ministry of Health / HIS)

Figure 2. Trends in Inpatient Child Mortality due to Malaria and Anemia, Malawi, 1985 - 1990

Table 1 shows that malaria ranked first among the leading causes of in-patient mortality among under fives in Malawi in 1989. Note that the fourth leading cause of mortality, anemia, is considered to be due largely to malaria as well.

Table 1. Ten Leading Causes of In-Patient Under Fives Mortality, Malawi, 1989

Rank	Disease/Condition	Number Deaths	% of 10 Leading Causes, < Fives Hosp. Mortality
1	**Malaria, incl... cerebral**	1478	19.4
2	Nutritional deficiencies	1470	19.3
3	Pneumonia	1139	15.0
4	**Anaemia**	1097	14.4
5	Perinatal causes	723	9.5
6	**Measles**	672	8.8
7	Enteritis and other diarrhoea	549	7.2
8	Diseases of the nervous system	265	3.5
9	Other infectious diseases	123	1.6
10	Tetanus	99	1.3
TOTAL		7615	100.0

(Source: MOH Statistical Unit)

In spite of the efforts to date, the malaria problem continues to worsen. Figure 3 (page 9) shows trends in infant mortality rates in Malawi over the last twenty-five years. The increase in recent years is largely due to the increase in malaria apparent in Figure 4 (page 10). The percentage of child outpatients presenting with malaria has also increased. The gains made to control other disease have not been realized by the malaria control program. Between 1982 and 1990 the number of hospital admissions for malaria almost tripled, from 21,000 in 1982, to more than 57,000 in 1990. The severity of the disease has worsened as the number of cases has increased. From 1985 to 1988 there was a 28% increase in incidence of children hospitalized with malaria combined with an increase in the hospitalized case fatality rate of children under five from 4.7% to 6.1%.

These statistics demonstrate the importance of malaria within the health picture in Malawi. A large proportion of health sector resources are devoted to malaria treatment, and a study currently in progress will document the economic costs to the country.

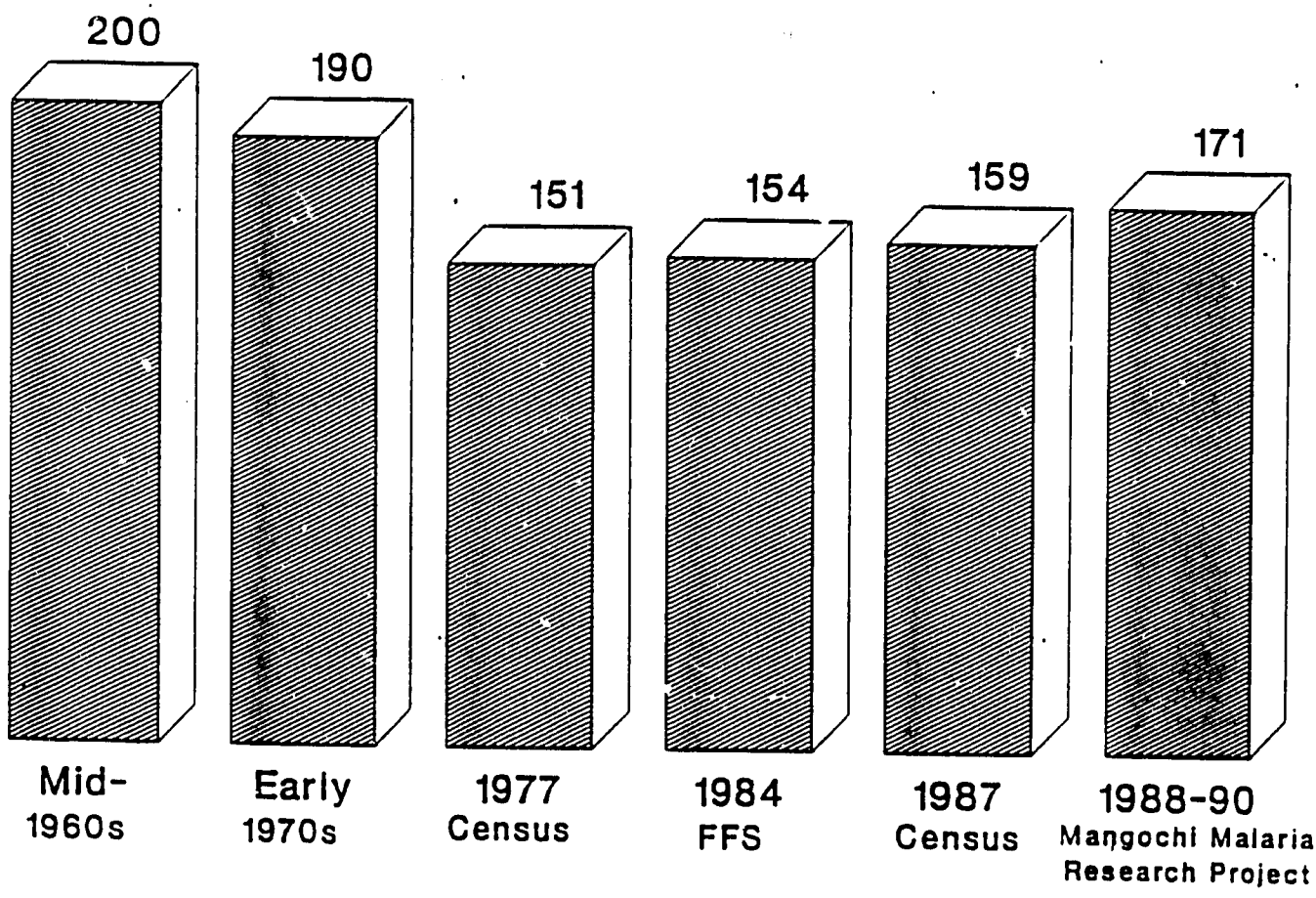
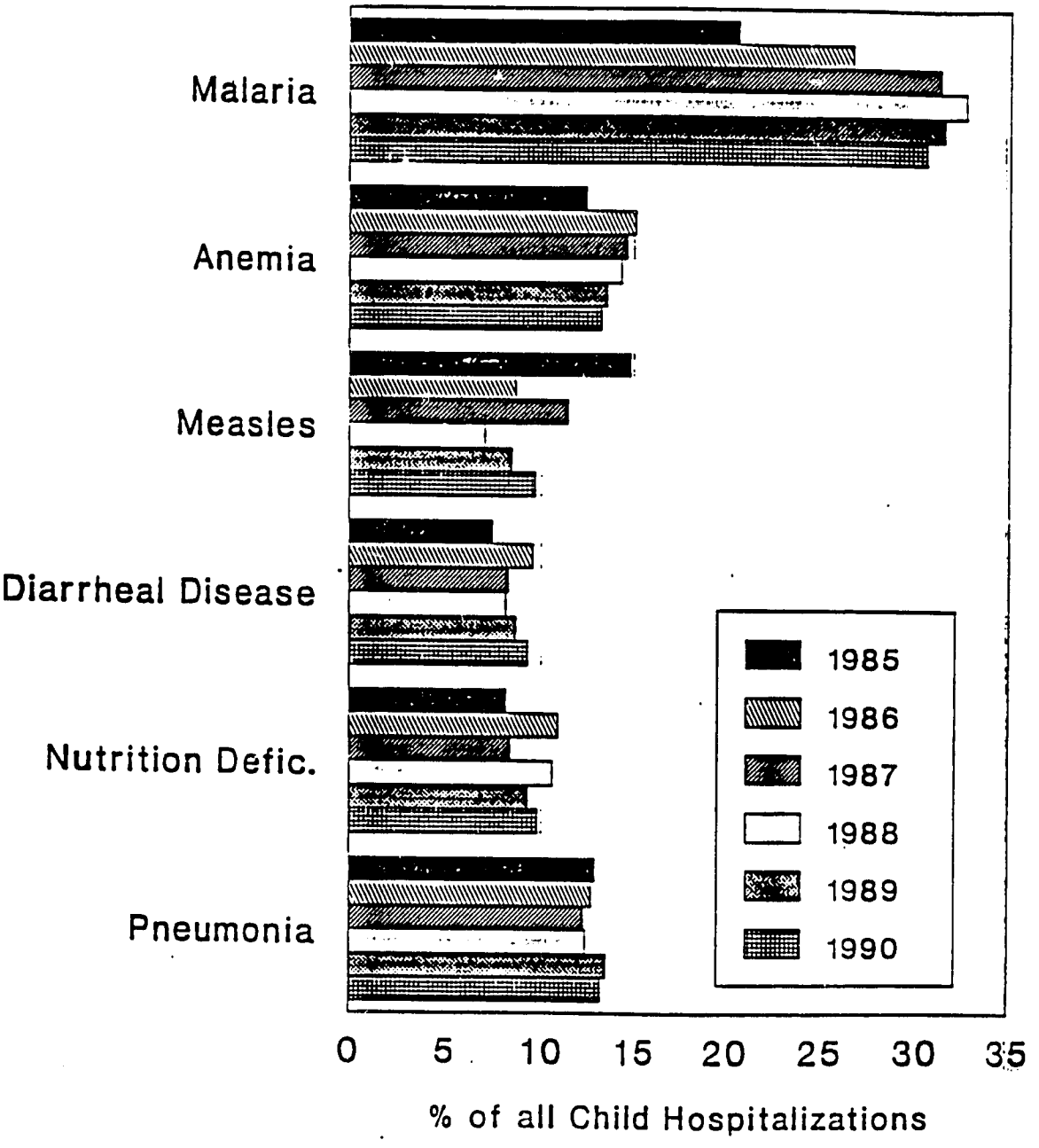


Figure 3. Trends in Infant Mortality Rates in Malawi



Source: Ministry of Health/HIS

Figure 4. Trends in Causes of Child Hospitalizations, Malawi, 1985 - 1990

3. World Health Organization Recommendations

In most of sub-Saharan Africa, as in Malawi, malaria is a major cause of morbidity and mortality. In recent years control methods have become increasingly ineffective and the toll of the disease, especially in children and pregnant women, has been rising dramatically. In response to this increasingly severe problem, the World Health Organization held three regional international meetings in the past year, and a global ministerial meeting on malaria will be held in Amsterdam in October, 1992. The aims of this meeting are to emphasize that malaria is a serious obstacle to socioeconomic development, to heighten the commitment to combatting the disease, and to mobilize resources and support for malaria control activities. A **new strategy for malaria control** is expected to be presented. It will call for:

- strengthening local and national capacities to provide effective disease management;
- developing capacities for planning and implementing selective and appropriate preventive measures;
- redefining the malaria problem to include not only the epidemiological criteria but also ecological, social, and economic determinants; and
- prevention or early detection and control of epidemics.

For the successful implementation of the strategy it is necessary that:

- there be sustained commitment from governments;
- malaria control be integrated within primary health care programs and coordinated with other relevant programs in non-health sectors;
- communities be full partners in malaria control efforts; and
- adequate human and financial resources be mobilized.

This strategy represents the integration of the recommendations developed at the three regional meetings. It represents a significant departure from previous strategies which relied heavily on vertical malaria control programs which were separate and distinct from the PHC system. It encourages integration of malaria control within the PHC system, community participation, decentralized management, and the development of capabilities and focused programs at the district level. The strategies developed at the first regional conference, held in Brazzaville in October 1991, were developed to guide governments in implementing malaria control programs. They are summarized in Attachment A.

As will be outlined below the MOH of Malawi has successfully completed many of the initial steps needed to implement the new community based strategy.

4. Malaria Control in Malawi: Recent History

A national malaria control policy evolved during the 1970s in Malawi that focused on chloroquine chemoprophylaxis for children under five, treatment of symptomatic malaria with chloroquine, and intradomiciliary residual spraying of insecticides for vector control.

By 1984, clinicians had begun to report widespread chloroquine resistance, and the Ministry of Health established a series of sentinel sites to investigate suspected drug resistance. Results of studies conducted at these sites indicated that 90% of children responded clinically to chloroquine within seven days, but that 60% continued to have low-grade parasitemias.

During that same year the MOH developed its first five year national plan for the control of malaria. This plan called for the creation of the **National Malaria Control Programme** (NMCP), the designation of a malaria program manager, and the creation of a five member National Malaria Control Committee (NMCC) to oversee program activities. The NMCP emphasized the prompt treatment of fever illness with chloroquine; treatment failures were to be given alternative drugs. Household level treatment was permitted, and chloroquine was available over the counter in grocery stores across the country. In addition, prevention of malaria in pregnant women using chloroquine chemoprophylaxis was promoted in antenatal clinics throughout the country. Finally applied research was conducted to determine the efficacy of chloroquine and alternative drugs, and guidelines for the treatment and prevention of malaria were printed and distributed throughout the country (the "Green Book," 1986).

From 1986 to 1990 the MOH, with support from USAID and CDC, developed the **Mangochi Malaria Research Programme** under the Combatting Communicable Childhood Diseases Project. It focused on 120 rural villages in Mangochi District and conducted a series of investigations to:

1) assess knowledge, attitudes, and practices related to the treatment of febrile illness in children and the prevention of malaria during pregnancy;
2) monitor the efficacy of antimalarials used in children;
3) determine the efficacy of several antimalarial regimens in the treatment and prevention of malaria in pregnant women.

The studies of drug efficacy found increasing rates of parasite resistance to chloroquine, with over 80% of children treated with this drug eventually demonstrating types RII and RIII resistance. These findings led the government to decide in 1991 to change from Chloroquine to Sulfadoxine-pyrimethamine (trade name Fansidar, but to be called "S-P" in Malawi) to treat malaria. Current plans are that S-P will become an over-the-counter drug on October 1, 1992, and that at the same time chloroquine will be come a prescription drug.

Studies of various prophylactic drug regimens during pregnancy have demonstrated that chemoprophylaxis can result in significant reductions in the frequency of low birth weight infants and in associated neonatal mortality. Four alternative prophylactic and periodic

treatment regimens (combinations of S-P and S-P and chloroquine) are currently being investigated. The results are expected to be reported in the fall of 1992.

In addition to the studies conducted at the Mangochi facility, research to evaluate and refine the treatment of severe malaria, particularly cerebral malaria has been conducted at the Queen Elizabeth Hospital in Blantyre. Support for that research is being provided by the Liverpool School of Tropical Medicine and Hygiene and Michigan State University.

The Second National Malaria Control 5-Year Plan - 1990-1994

In 1990 the MOH issued a revised a 5-year plan. Its goal is to reduce the malaria related mortality by 10% and malaria associated morbidity by 20%. To realize these goals ten program elements were identified for strengthening:

1. Improved understanding of malaria illness, prevention and treatment in the general population;

2. Accurate diagnosis of malaria illness nationwide;

3. Effective malaria treatment available and correctly used nationwide;

4. Effective prevention for high risk groups (pregnant women, children under 5 years of age, children with sickle cell disease, and children with recurrent febrile convulsions);

5. Alternative methods of control related to malaria vector biology and ecology;

6. Training in malaria diagnosis, treatment and reporting incorporated into all training programs at all levels of the health care system;

7. Strengthening of the malaria reporting system;

8. Effective management and administration of the NMCP at national, regional, district, and community levels;

9. Increased capability to conduct research in malaria; and

10. Increased Government of Malawi and donor support for malaria control.

The activities outlined under each point are of three types: training, operations research, and monitoring and evaluation. In addition, general management and operational support is called for.

PHICS Project Support

In 1989 the Promoting Health Interventions for Child Survival (PHICS) Project was authorized by USAID. The goal of the project is to assist the GM to improve the health status of rural Malawians, with emphasis on decreasing morbidity and mortality in children. The project has two main components -- institutional development and service delivery. Under this project a long term technical advisor will be made available to the MOH to assist in the management of the NMCP. The PHICS project is also designed to facilitate the implementation of the second five-year malaria control plan. Training materials and curricula developed under this project will include the priorities of the five-year malaria control plan.

Several activities funded under the PHICS project and supported by technical assistance from the Centers for Disease Control and USAID's centrally funded Vector Biology and Control Project have been planned and/or initiated including:

a) **Surveillance and monitoring activities:**

- A system for monitoring in-patient malaria morbidity and disease outcome will be tested in the Pediatrics Department of Kamuzu Central Hospital. If successful, attempts will be made to expand it to other hospitals.

- Plans have been made to recruit Regional Surveillance Officers, funded by the PHICS project, to conduct surveillance and to direct efforts to control and prevent communicable diseases at the regional level. (None of the positions has been filled.)

- Six sentinel sites have been established to monitor malaria: Bolero, Chintheche (Northern Region); Chitowo, Kapiri (Central Region); Muona, Neno (Southern Region).

- Three of four quarterly vector assessments in three ecological regions (Lower Shire Valley, lake shore, and central highlands) have been completed.

- Studies on drug sensitivity have been carried out in three sites to monitor for resistance.

b) **Operations research activities:**

- A KAP study regarding malaria was conducted in May 1992 to guide the development of targeted health education messages.

- The economic impact of malaria in Malawi is currently being evaluated. This study will provide information for effective resource allocation by the GM and

by donor agencies. It will also provide baseline data to assess the economic effect of future interventions.

- The evaluation of different chemoprophylaxis and periodic treatment regimens for pregnant women will be completed in November of 1992 and will provide information necessary to determine an effective regimen for reducing malaria in pregnant women.

c) **Training activities:**

- Training of the microscopists to staff the sentinel sites.

- Refresher training of 120 microscopists (10 per month) to staff the District Hospitals is under way.

- ELISA training for the malaria vector assessment activity has been initiated.

Other Donor Support

While USAID is the primary donor supporting malaria control efforts in Malawi, other organizations have also provided assistance to the NMCP. In the past, UNICEF has provided chloroquine and will now supply limited quantities of S/P through the Essential Drug Program. It will also bednets and insecticides for the proposed WHO bednet study. WHO support will focus on training and resource mobilization for the bednet study. IDA will provide vehicles and some drugs under the PHN sector credit.

5. Health Care in Malawi: the Institutional Context

The Ministry of Health

The operational arm of the Ministry is the Health Services Department, which carries responsibility for Clinical, Nursing, Planning, Technical Support, and Preventive Health Services. Responsibility for malaria control resides in the Preventive Health Services Section along with most other disease control programs.

There are more than 700 health care facilities comprising hospitals, health centers, dispensaries, and health posts in operation in Malawi. The MOH structure and health service positions have been described extensively in previous PHICS documentation and will not be repeated here except when discussing activities relating directly to malaria control.

There are 49 general service hospitals and 2 specialized (mental and leprosy) hospitals.

Approximately 60% of these are operated directly by the Ministry of Health, with the rest operated by the Christian Health Association of Malawi (CHAM). The Ministry of Local Government (MOLG) operates facilities in 22 of the 24 districts and in four major cities, Various non-governmental organizations (NGOs) and private practitioners also provide health services. Estimates of the percentage of Malawians living within a 2 hour walk of some kind of health facility range from just over 50% to over 80%.

Three large central hospitals in Lilongwe, Blantyre, and Zomba provide a total of 6,815 beds, just under half of all beds in the country. MOH resources are allocated disproportionately to such curative, urban facilities.[3] Both inpatient and outpatient capacities at all hospitals are intensively utilized. As one example, Mangochi District Hospital is rated as having 220 beds, but the Officer in Charge reports an average census of 350 patients.

Other Health Care Institutions and Capacities

The Christian Health Association of Malawi operates 150 facilities with approximately 5,000 beds. They provide services to approximately 1.3 million patients annually, including one-third of hospital admissions. The CHAM facilities offer services that are similar to those offered in MOH facilities; the major difference is that CHAM facilities charge a nominal user fee for curative services, whereas MOH services are provided free. Preventive services in CHAM facilities are free. The MOH provides about one-third of the funding for CHAM facilities, principally salary support. In addition to direct service provision, the CHAM system plays a major role in the training of health personnel, particularly the training of nurses.

In addition to MOH, CHAM, and MOLG facilities, a number of non-governmental organization are delivering health care and preventive services at the community level. Many private enterprises that employ and house large numbers of people, such as agricultural estates, provide health services to their employees. These are expected to follow MOH policies but are not within the official health care system. The current drought emergency in Malawi is bringing additional resources and manpower to assist with nutritional, food distribution, health, and other programs. The large and growing number of Mozambican refugees in Malawi are placing additional strains on the delivery systems. The Malawi government and its people should be commended for the assistance they have provided to the refugees.

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[3] A recent World Bank aide memoire reports that "it could be argued that approximately 85% of resources and priorities are directed to the benefit of 10-15% of the population and that 80% or more of the Malawi people are out of reach of the core activities of the health sector."

Preventive Health Services - Malaria Control

As noted, responsibility for Malaria control falls under Preventive Health Services which is divided into two program areas, Family Health and the Community Health Sciences Unit (CHSU). Family Health operates programs for MCH, EPI, Child Spacing, Nutrition, and TBAs. CHSU is responsible for the Health Information System, the Public Health Laboratory, the Health Education Unit, Epidemiology, Environmental Health, and numerous disease control programs of which Malaria is one.

The Community Health Sciences Unit (CHSU)

The organizational structure of CHSU and its physical location away from Ministry headquarters pose problems for the relationship between the disease control program managers and the line management within the ministry. As originally conceived, CHSU would provide the Ministry with certain core services including health statistics, the central public health laboratory, and epidemiology. It possesses special skills and capabilities in research, surveillance, and information systems. In part because of the lack of physical space at the Ministry of Health, and in part because of complementarity with CHSU's role in epidemiology and health information systems, it was decided to house the disease control programs (Malaria, Diarrheal Disease, ARI, Trypanosomiasis, Onchocerciasis, Schistosomiasis, Tuberculosis, Leprosy, etc.) at CHSU.[4] From one point of view this makes perfectly good sense: it provides these programs with a research base having epidemiologic, laboratory, and data management skills that are not available elsewhere. Outweighing these factors, however, is the fact that the disease control managers are separated from the line management structure within the Ministry that controls personnel and service delivery resources. This limits the role the program managers can play in directing and supervising service delivery efforts. There is a tendency to view the CHSU as a separate research unit; the placement of the disease control managers at CHSU reinforces the perception that they are divorced from the day-to-day management of the programs, the resources and the personnel who actually deliver services to people. In the words of one senior Ministry official, "... It is unfortunate that we have the disease control managers at CHSU. There is room for a little bit of conflict." The Ministry acknowledges the awkwardness of this separation and is studying options to remedy the situation.

The Malaria Control Program

The 1990 - 1994 National Malaria Control Program has been described above. It contains objectives, plans, guidelines, strategies, and activities for a comprehensive and ambitious

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[4] The AIDS program is an exception. It is located prominently within MOH headquarters and appears to benefit from its visibility there.

malaria control effort. Successful implementation of the NMCP depends on donor support for various components of the plan as well as on the commitment of the government of Malawi. Uncertainties about levels of support. the availability of trained manpower, and other factors have created delays in the implementation timetable. The decision to move from chloroquine to sulfadoxine-pyrimethamine as the treatment for uncomplicated malaria was taken in October 1991. It was estimated that all the elements of a comprehensive campaign (drug, treatment guidelines, training, media materials) would take one year to be put in place. A 1 October 1992 date was set to execute the policy change and "launch" S-P as the new treatment for malaria. Central Medical Stores placed an order for S-P in April with a contract stipulation of delivery within 90 days. This deadline was not met, and there is uncertainty about when the drug will be available.[5] This uncertainty has made it difficult to plan and schedule a coordinated campaign to launch the new drug and the new treatment guidelines.

The current five-year plan for Malaria control identifies a broad list of activities in the areas of research, surveillance, training, case management, drug system strengthening, supervision, alternative methods of control, community programs, mass media campaigns, and laboratory capacity building. The plan serves as a vehicle for soliciting donor support for various activities under the plan, with full knowledge that not all activities will be supported. Given this reality, there is a need to conceptualize a more focused and sequenced implementation plan based on the actual level of support available, and reflecting present constraints and realities. Additional attention must be paid to the introduction of the new drug to treat malaria and to the delivery of services that can reduce mortality and morbidity.

Institutional Constraints

There are a number of important constraints affecting the provision of malaria control and prevention services at the present time.

Management Time, Attention, and Priority. On numerous occasions in the past it has been recommended that a full time Malaria Control Program Manager be named to give full time attention to malaria. As the single disease that accounts for 36 percent of visits to health facilities, and the disease that is the greatest killer of children, it is difficult to understand why the malaria program does not have a full time manager. Of all of the Child Survival intervention programs in Malawi, Malaria is the only one where the situation is getting worse. Increases in infant and child mortality in recent years are attributable primarily to increased incidence and deaths from malaria. Onchocerciasis, Trypanosomiasis, and Schistosomiasis all have full time managers, while the Malaria Control Program Manager must manage Diarrhoeal Disease Control as well, another major program which also deserves a full time manager. A proposed new organization structure of the CHSU, recently

[5] Foreign exchange shortages add to the uncertainty of imports such as drugs.

submitted for approval, maintains responsibility for both Malaria and Diarrhoeal Disease in the hands of the same manager.

Personnel Constraints. The personnel practices of the government of Malawi, combined with the constant drain of skilled personnel to better paying jobs in the private sector and outside the country, have resulted in what appears to be a permanent shortage of trained health manpower. Doctors are trained abroad and expected to return to government service, but the policy does not appear to be enforced. Only about twenty Malawian physicians are in government service, roughly the same number as fifteen years ago. The new Medical School in Blantyre aims to provide the final year of training to physicians trained abroad and includes an introduction to community medicine, but the preference for specialist status is likely to draw almost all physicians out of public health service. One result is that, after 28 years of independence, all District Health Officers in Malawi are expatriates, as are two of three Regional Health Officers. They explain that their positions have little prestige in the Malawian system, consistent with the penchant for advanced degrees and specialized training. Management experience and skill do not appear to have particular value in this context.

The requirement that government personnel must be provided with government housing of a quality commensurate with their grade is another factor limiting staffing, especially in rural areas. Women must be assigned to the same community as their husbands, with the result that the major cities are full of Community Health Nurses in government employment, while rural areas have shortages. One of the factors blamed for the inability of the MOH to post its own staff to the Mangochi Research Station is the lack of government housing there. A previous draft of this amendment included the construction of such housing.

A fascination with advanced degrees and credentials permeates the system. Many expatriates function without counterparts, losing opportunities for technology transfer, simply because Malawians with equivalent credentials cannot be found. Even so, the credentials insisted upon in the health sector are likely to be scientific rather than representing the management skills needed to put scientific knowledge into practice. It seems typical that the two CHSU staff members currently studying in the United States are completing PhD courses while CHSU is sadly understaffed and master's level training would probably suffice.

The result of this situation is demonstrated by the positions which PHICS agreed to fund some two years ago. Of a total of 130 positions identified, less that thirty have been filled. Many personnel who would occupy those positions, such as the Regional Surveillance Officers, could play an important role in supporting efforts at malaria control and prevention.

The In-Service Training System. The volume of training in Malawi, and its popularity as "the" solution to health care problems is remarkable. Exaggerated per diem payments to health care personnel who attend workshops and training seminars have become the rule, creating a situation where the primary motivation to attend training is money, and the amounts available justify a scramble to participate in training. It has been observed that it is usually the same persons who always manage to attend the training sessions. A health

worker can double his or her monthly salary by attending a training program and cannot be faulted for responding rationally to this system of incentives which distorts the motivations and values of health care workers. The sliding scale whereby higher grade officers receive higher per diem payments creates a situation whereby all levels of personnel, including trainers and managers, are rewarded for attending training programs. Donor organizations have frequently been pressured into providing high per diems as well. If the volume of training were to be cut in half and the money used for supervision and transport, the quality and quantity of service delivery, including those for malaria control, would be dramatically improved.

Long Term TA for the Malaria Control Programme. Two long term advisors are currently being recruited for positions that will support the Malaria Control Programme. One will be a physician/epidemiologist who will head the CHSU Epidemiology Unit; the other is a Malaria Control Technical Advisor who will help plan, implement, and evaluate the national program. The Malaria Technical Advisor is to serve as a counterpart to the MOH Malaria/CDD Program Manager. In light of the major recommendations of this report, which focus on the strengthening of the service delivery components of the malaria control program, it is recommended that this advisor's job description be modified to place added emphasis on the program management, supervisory, and monitoring aspects of the malaria control program.

Guidelines for the Management of Malaria. The Ministry of Health is preparing revised guidelines for the prevention and treatment of malaria, using Sulfadoxine-Pyrimethamine for uncomplicated cases. A few observations and suggestions are in order for the consideration of the National Malaria Control Committee:

1. The guidelines do not recommend a second line drug to be used when there is no significant clinical improvement from S-P after 72 hours. The role of amodiaquine, mefloquine, or halofantrine, if treatment failures occur, should probably be specified.
2. The guidelines state that chloroquine has lost its effectiveness in young children but that it remains effective in older children and adults. It is probable that adverse sequelae are not observed in older children and adults because of their acquired immunity and not because of the differential efficacy of chloroquine. This should be clarified.
3. The guidelines still recommend chloroquine for use in older children and adults, but if chloroquine is to be restricted as a prescription drug, it will become increasingly difficult for adults to gain ready access to chloroquine. This should be clarified too.
4. The guidelines do not completely spell out what information is to be recorded about cases of malaria and how that information is to be reported, aggregated, analyzed and used. Since the monitoring of the changed treatment program must be carefully monitored, that should be clearly defined.
5. The health education messages identified in section IV.C. are observations of what should be done or encouraged and are not "specific messages". More attention should

be given to the specific messages and instructions that should be given to patients and to various cadres of health care workers.

6. There is a need to translate the guidelines into a convenient, easy-to-use, and accessible pamphlet (such as the "green book") which can be widely distributed to health workers.

The Health Information System. As currently constituted and staffed, the HIS cannot satisfactorily provide useful information with which program managers can make decisions, nor does it provide feedback on a timely basis to regional, district, and more peripheral levels. Partly this is the result of a staffing situation that is largely beyond the control of the MOH. Statisticians are provided by the National Statistics Office and can be reassigned at the discretion of that office without MOH concurrence. The senior statistician at MOH was transferred to work on the census last year and is not expected to return. One successor died; another resigned; the VSO computer programmer was withdrawn because no Malawian counterpart was available; the PHICS epidemiology TA position with a certain responsibility for the HIS has not been filled. Partly as a result of the weakness of the central HIS, the Regions have recently begun to process their own information and statistics.

Even if the personnel situation could be sorted ut, however, the quality and quantity required by the HIS needs careful review. Information that is not needed to make decisions should not be processed, and catching up on data from previous years should probably be abandoned[6] Information should ideally be processed at regional and district levels for management use before being sent on to the national level rather than waiting for feedback to come back from the center.

Correcting the HIS would appear to be within the scope of the Epidemiologist and beyond the scope of this malaria amendment to the PHICS Project. Information needed to manage malaria activities will have to be garnered, in the short term at least, from local information systems and from surveys. Encouraging the testing and perfecting of such systems in an operations research fashion for malaria control could eventually prove a valuable contribution to the national Health Information System.

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[6] Samples from selected months might suffice as a compromise.

C. DESCRIPTION OF AMENDMENT OBJECTIVES AND ACTIVITIES

1. Goal, Purpose, and Technical Approach

The **GOAL** of this amendment to strengthen the malaria component of the PHICS Project is **to improve the health of the people of Malawi by decreasing morbidity and mortality due to malaria, particularly in children under five years of age and in pregnant women.**

The **PURPOSE** is to improve the capacity of the National Malaria Control Programme to coordinate health efforts within Malawi to accomplish that goal.

The **TECHNICAL APPROACH** required to accomplish this objective has four principal components:

a. appropriate case management,
b. prevention,
c. strengthen health services,
d. monitoring, policy guidance.

a. Assure appropriate case management of malaria.

A direct means to decrease morbidity and mortality due to malaria is to assure that all cases of presumed and confirmed malaria are treated promptly with correct doses of an appropriate antimalarial drug. The severity of the case will determine the correct drug to use. In addition, appropriate case management may include:

- antipyretics and supportive care,
- follow up to be sure malaria symptoms have resolved and to watch for possible drug resistance and/or side effects,
- referral as necessary,
- confirmation by microscopy as available,
- treatment of any intercurrent conditions, and
- reporting of cases in accordance with public health policy.

What is appropriate may vary with the resources and expertise available in different situations and at different levels of the health care system. Guidelines developed and disseminated by the National Malaria Control Programme should define what is expected in various circumstances.

Since not all Malawians have immediate access to the organized health care system, self-treatment and treatment of children by a parent or caretaker may be appropriate. Guidelines for such care should be developed and widely disseminated as well.

b. Promote effective methods of prevention.

Even better than appropriate case management, of course, is prevention of malaria. Various methods are available and should be promoted in accordance with the guidelines of the National Malaria Control Programme. These include barrier methods such as protective clothing, screening, and bednets (which may be impregnated with insecticide). They also include repellent methods such as mosquito coils and traditional methods. Chemoprophylaxis or periodic treatment of certain high risk groups such as pregnant women (primigravidae in particular), children with a history of multiple febrile seizures, and persons whose immune systems are compromised may also be part of the variety of preventive measures recommended. Finally, vector control measures such as destruction of vector breeding sites and carefully selected use of insecticides or larvicides may be appropriate in specific situations.

c. Strengthen capacity to provide child survival services.

The integration of malaria control interventions into the full complement of child survival activities is essential to provide the greatest possible access to services at an affordable cost and to promote sustainability. Strengthening the capacity to provide all such health services will improve malaria management without competing unnecessarily with other priority health programs. Malawi has embraced the WHO concept of devolving significant responsibility to more peripheral health workers, and the District Health Team in particular. Malaria activities should be integrated within that structure whenever feasible.

A significant portion of health services in Malawi is provided by private, non-profit hospitals, many of them receiving assistance from the MOH through the CHAM network. There and a number of other non-governmental organizations are involved in the health sector in Malawi. Facilitating their capacity to provide and to promote malaria control services will increase the reach of the whole health program.

d. Maintain research and policy development capability.

The history of malaria control is one of approaches that change and evolve as some become less effective and others become more appropriate. Applied and operations research are needed to set and revise policy over time. In recent years Malawi has developed the capability to carry out applied malaria research and to make informed policy decisions. Although the recent decision to replace chloroquine with sulfadoxine-pyrimethamine for first line treatment requires that special effort be directed to implementation at this time, the ability to monitor the consequences of the policy change and to make

adjustments as needed must be maintained. For that reason support to maintain the applied research capability of the MOH is crucial.

2. Roles and Responsibilities

As described in a previous section, Malawi has developed a strong research capability to guide its malaria control activities and to monitor their implementation. Impressive gains have been made in the understanding of malaria control -- the identification of new therapeutic and preventive interventions that can have an impact on malaria morbidity and mortality. The natural evolution of the program is to focus now on how those research findings can be applied to improve the health services for the individual and the family in Malawi. What is needed at this time is to expand the "ownership" of malaria control to include all cadres of health workers caring for persons with malaria and to promote more effective methods of prevention. What is needed, in short, is to maintain the research capability and increase support for implementation.

Role of the National Malaria Advisory Committee

The National Malaria Advisory Committee must provide oversight of the malaria situation in Malawi and the possible interventions that might be employed. This is especially important at a time when the biology of malaria and the approach to it are changing. The existing committee has performed this function well and can be expected to continue to do so. No special additional resources are needed.

Role of the Community Health Sciences Unit (CHSU)

The Community Health Sciences Unit of the MOH has been charged with the coordination and management of the malaria control program in Malawi. With its malaria research arm at Mangochi, it is well placed to coordinate malaria research and to monitor the malaria situation in the country. With guidance from the National Malaria Coordinating Committee, it can disseminate policy, monitor malaria research and control activities, and provide technical guidance to the persons and organizations at the service delivery level throughout Malawi. This capability should be strengthened.

On the research side, CHSU should be supported to develop a research agenda whose results will have a direct and significant impact on the activities of the NMCP and the health of the target population in Malawi. Funding should permit, at a minimum, completing the ongoing research at Mangochi into chemoprophylaxis and/or timely treatment of pregnant women, completing the vector assessments already planned, and collaborating with the proposed WHO bednet study. The existing laboratory, housed in the tailor's room of the District Hospital, should be replaced with an expanded laboratory which can be used for subsequent research, to strengthen the capacity of the Mangochi District Hospital laboratory, and to serve the students of the Medical School during their community health rotations in

Mangochi. The laboratory at Mangochi should be limited, however, in order not to drain resources unduly (including management and supervision time) from the national public health laboratory complex at CHSU itself. Certain functions, such as laboratory support for the sentinel sites monitoring possible S-P resistance, may be located better at CHSU's central laboratory facility.

CHSU should also coordinate with other medical research activities in the country. These include the research into severe childhood malaria being conducted with support from the Liverpool School of Tropical Medicine and Hygiene and Michigan State University at Queen Elizabeth Central Hospital in Blantyre, as well as operations research in practical topics such as the distribution and sale of bednets in the community which several NGOs active in Malawi are eager to begin.

CHSU should also be supported to improve the national health information system and a national epidemiology capability. Assistance is already available through the PHICS epidemiology position soon to be filled. CHSU should help to clarify policies and to disseminate information throughout the Malawi health establishment. It should be a national source of technical guidance in training and in defining health education messages relating to diseases of public health importance. Aside from managing a part of the research and laboratory services, however, CHSU cannot by itself implement essential disease control activities that depend on the actions of more peripheral health personnel. That is where both the public and private sectors of the service delivery system must assume their shares of responsibility for malaria control in Malawi.

Role of the MOH service delivery system in malaria control

Once the policies for malaria control are defined, the implementation of the actions required is the responsibility of the clinical medical services, including the hospitals, the health centers and dispensaries, and the peripheral health workers extending out to the HSAs and the CHVs with whom they work in the community. For the rural areas these services are coordinated by the District Health Team led by the District Health Officer (DHO) under the guidance of the Regional Health Officer. The significant change represented by this amendment to the PHICS Project is the provision of assistance to Regional and District Health Teams to improve implementation of malaria control in their areas.

As recommended by WHO, and conforming with the latest recommendations of WHO/Brazzaville concerning malaria control strategies in Africa, emphasis will be placed on strengthening the capacities of the District Health Team and its activities that reach out to the health centers and communities. The focus of this support will be improved malaria control, but the capabilities developed will strengthen the capacity of the peripheral health system to provide a package of essential health services including MCH services; care of diarrhea, respiratory tract infections, and other common medical problems; health education; and other preventive services. As the ability to manage the range of services that should be available to the population through the health services increases, the ability to manage malaria will

increase as well. The development of separate vertical structures will be avoided: training will be through the usual mechanisms; drugs will be supplied through standard channels; information will flow through the regular health information system (except for special research). The personnel within the system will be encouraged to participate in finding new ways to provide better services.

Because the resources available under this amendment are limited, and to facilitate the management and monitoring of the activities undertaken, not all 24 Districts will participate in every activity of the program. Operations research, for example, is expected to be selective. If the systems developed in one District prove to be successful, it is expected that they will be applied elsewhere as time and resources become available.

Assistance directed to the decentralized portions of the MOH is expected to result in the development of peripheral health services that can manage the routine aspects of malaria control and other interventions.

Role of the non-governmental sector in malaria control

Extensive cooperation exists between the government health system and the non-governmental sector, particularly the CHAM hospitals and their outreach facilities. This will be promoted, particularly at the level of the District health management team. There are NGOs in several districts who have health interests and local expertise. Such NGOs should be encouraged to contribute to malaria control as appropriate. Because government health services are sometimes less flexible than the private sector in testing new approaches to service delivery and its management, PHICS will provide limited support to private organizations.

3. Activities for Malaria Control Support

The strategy of this amendment of the PHICS Project is to provide funding to accomplish the following:

a. Promote an approach to malaria control in Malawi which balances research and service delivery, expanding responsibility for malaria control to include health service providers at all levels.

b. Support continued applied research by CHSU, primarily through the Mangochi research station, to guide malaria control policies in Malawi.

c. Strengthen malaria control within Malawi by increasing the capacity of regional, district, and peripheral health teams to carry out programs at the service provider level.

d. Provide special funding for NGOs to develop new approaches to malaria prevention and control.

e. Support the design and implementation of a national campaign to introduce Sulfadoxine-Pyrimethamine (S-P) as the first line drug for treatment of presumed malaria in Malawi.

Each of these strategic approaches will be described in greater detail below, highlighting expected activities, the persons, responsible for their implementation, and the level of effort required. Where existing mechanisms within PHICS can contribute to the outcomes anticipated, that will be noted. Illustrative budgets can be found in the following section of this document (pages 35-38).

a. Promote an approach to malaria control in Malawi which balances research and service delivery, expanding responsibility for malaria control to include health service providers at all levels.

1). In order to increase program management expertise, particularly to strengthen service delivery, **a locus of malaria control management should be established within Ministry of Health headquarters.** This should include one fulltime Malawian manager and technical assistance provided through the PHICS mechanism. They will have direct access to regional level program management personnel who can direct service delivery at district and peripheral levels. Management of applied research and policy development will remain within CHSU. The result will be two foci of program management -- one within CHSU for scientific expertise and policy development, the other in the "line" service delivery hierarchy for the delivery of malaria prevention and treatment services.

One person will be designated within the service delivery hierarchy of each region as the malaria program manager. One option is to designate the Regional Surveillance Officer position, ready for funding under PHICS, to be this manager. Together, the three regional program managers and the two national level managers (from service delivery and CHSU respectively) will constitute the **Malaria Program Management Team**, with responsibilities for implementing malaria control interventions throughout the field portions of the Ministry structure.

This requires that adjustments in responsibilities and job descriptions be made by the MOH assure that essential team members can function within the service delivery hierarchy. Since malaria management TA is already provided for with PHICS funding, no significant additional funding will be required. Because this action is required at once in order to manage peripheral implementation activities, it will be presented as a condition precedent to the amendment.

2). Foster broader health sector participation in malaria control in Malawi by giving

greater responsibility and resources to health personnel at regional, district, and peripheral levels (section c below). **In addition, local NGOs will be incorporated into the team** responsible for malaria control at the district level as appropriate. NGOs may be provided separate funding (section d below) to permit their contribution to malaria control in ways that facilitate local initiative and flexibility.

Funding will be available for district level programming of IST, health education, supervision, monitoring, and operations research, with the approval of the Malaria Program Management Team. Within wide guidelines to be established by that team, the District Health Team will be expected to plan, implement, and monitor its own malaria control efforts. All districts will not necessarily receive the same level of support. The seven districts designated for special attention by the PHICS Project because of their high levels of infant and child mortality are expected to receive greater funding.

3). **Focus the malaria research agenda** in Malawi so as **to guide service delivery** to reduce morbidity and mortality, particularly **among children and mothers.**

This is in line with the current research agenda of the Mangochi Research Station and of the target population of the PHICS Project. Such research is described under section b (applied research) and sections c and d (operations research) below.

Funding implications: Since PHICS funding has already been identified to support the individuals who will comprise the Malaria Program Management Team, and funding for more peripheral levels is provided below, no additional resources are provided by this amendment.

b. Support continued applied research by CHSU, primarily through the Mangochi research station, to guide malaria control policies in Malawi.

1). **Expand the existing facilities/capabilities** of CHSU **at the Mangochi Research Station,** integrating to the extent possible with the District Hospital Laboratory and the Community Medicine program of the Malawi Medical School at Mangochi. Funding will be provided under this amendment to permit:

- construction of new laboratory facilities/temporary living quarters in such a way as to coordinate with the Mangochi District Hospital laboratory and to permit Medical School students access to laboratory facilities when in Mangochi for community health rotations;

- procurement of basic laboratory equipment for CHSU/Mangochi (details in the commodity procurement section below);

- operating costs for CHSU/Mangochi, including supplies, rent, utilities, and maintenance on a decreasing scale (first year 100%, second year 75%, third year 50%, fourth year 25%, fifth year none) that will permit the MOH gradually to take over the operation of the facility.

2). **Provide salary support** for one Laboratory Technician and two Laboratory Assistants on a decreasing scale (100% for the first year, 75% for the second year, 50% for the third year, and 25% for the fourth year).

These three persons are conceived to be a core laboratory staff under CHSU authority who are available to contribute a core of laboratory expertise to a variety of research activities, to maintain the equipment and supplies, and to provide assistance as appropriate to the hospital laboratory staff and to medical students. Decreasing salary support will permit the Ministry to assume the recurrent costs of this staffing without hardship while demonstrating its intention to institutionalize such research capacity. The intention is that the balance of laboratory staff required for research purposes will be employed using funds designated for specific research projects as is the usual practice for research laboratories.

3). **Support applied research**, the results of which will have a significant impact on malaria control in Malawi. All necessary salaries, supplies, and technical assistance (aside from that already provided from PHICS through other mechanisms) will be supplied in the research budget.

The research agenda of the CHSU/Mangochi is expected to include:

- WHO bednet study,
- assessment of presumptive diagnosis of malaria,
- efficacy of sulfadoxine-pyrimethamine in selected study populations, and
- population dynamics and insecticide resistance of vector populations.

Funds will provide TA to help to coordinate the bednet study and to help plan the other studies. Operating funds will be available for all but the WHO study which is expected to receive combined funding from several sources.

4). Provide eventual **entomological capability** within the NMCP by funding the training of a student to the M.Sc. level in medical entomology. Two years of tuition and expenses will be provided. Afterwards, the student is expected to be engaged to provide entomological expertise to CHSU for studies including, but not limited to, the transmission of malaria.

c. Reinforce the health service delivery system to be able to provide malaria prevention and treatment services by strengthening the capacity of regional, district, and peripheral health teams to commit greater resources to malaria control at the service provider level.

1). Make **malaria program management adjustments within the MOH** as described above:

- Designate a fulltime malaria program manager within the service delivery hierarchy of the MOH. This person's management skills are more essential than scientific or medical skills.

- Direct the malaria management TA provided by PHICS to function as a counterpart with this manager.

- Designate a malaria program manager from each of the three Regions of Malawi with responsibility to strengthen health service delivery from region to district to peripheral levels for malaria and other diseases of public health importance.

2). **Strengthen critical functions of the MOH** to be able to implement malaria control. Funding will be available for selective activities that improve the capacity of the Ministry to carry out actions that can be standardized. Note that some of these actions may be carried out in conjunction with the campaign to launch the S-P policy as described in section 5 below. Functions for which funding will be available include the following:

- Development of **training curricula and materials** for various levels of personnel. Three months of short term TA will be available as needed, and both preservice training to be carried out by the existing system and in-service training to be carried out by service delivery supervisors will be supported. Additional support should be available through PHICS support for health system training.

- Development of **health education approaches and materials** for the malaria control program. Anticipating that policy adjustments will probably be required during the life of the Project, two months of short term TA will be available in addition to that provided during the S-P launch phase.

- Dissemination of information concerning malaria control to health care providers throughout Malawi. It is recommended that a **malaria newsletter** be prepared by the Malaria Program Management Team, with technical input from CHSU, and published every six months. The format should be similar to that which UNICEF/Malawi uses to inform health service providers. At least

6500 copies of each issue should be printed and mailed to all health workers.

- **Maintaining quality control of district laboratories.** Funds will be provided to monitor the quality of malaria microscopy and the appropriate use of microscopy results at district level. One month of TA to assist in the development of an appropriate quality control protocol and methods will be provided in additional to operating expenses.

- **Routine monitoring for resistance to drugs, drug side effects, possible treatment failures, and referrals.** Because Malawi is the first country in Africa to adopt as a national policy the routine use of S-P to replace chloroquine, it will be important to monitor this exercise carefully. Documenting the nature and frequency of side effects and the frequency of treatment failures (with confirmation that they are true failures). If a new policy regarding chemoprophylaxis or periodic treatment of high risk populations is adopted, that policy will have to be monitored too. Follow-up on treatment of both presumed and confirmed malaria should become part of the routine of health care providers. Designing and instituting a system to encourage that to happen should be an objective of the National Malaria Control Programme.

  The existing system of six **sentinel sites** should be reviewed to accommodate changed policies and to determine whether they are functioning properly and collecting appropriate data. Funds will be provided, and TA made available (up to two months as needed) to assure that both a routine system and the specialized sentinel system are established and maintained.

- Encourage **operations research** by sponsoring a yearly contest for the best new malaria control ideas. As the national malaria strategy changes over the next few years, it will be useful to encourage operations research and fresh approaches. A yearly competition in conjunction the malaria newsletter will be supported.

3). **Increase the capacity of district teams by providing them with their own funding** to be used to support the local management of malaria control activities. Approval would be required from the Malaria Program Management Team, but the details of how the funds would be employed would be left largely to the District Health Teams to encourage them to organize their activities in ways that are most appropriate for the local circumstances. The following types of activities should be organized using such funds:

- **In-service training.** This could be organized at district level or at the level of health centers to permit the training of entire of health center teams and their outreach personnel. There should be an attempt to economize on per diem

costs which have become unreasonably high in recent years in Malawi. Different Districts would be permitted to organize their activities in different ways.

- **Health promotion and community education.** As with in-service training, local approaches will be encouraged.

- **Monitoring and supervision.** Here too local methods are expected to be developed. Monitoring systems that collect no more information that is needed for decision-making will be encouraged, and supportive supervision methods that encourage quality assurance and realistic problem-solving at the local level are the objective.

- **Operations research.** Local efforts to develop effective and efficient approached to promote and manage malaria control activities will be encouraged. Areas for operations research include effective case management at community and household level, the promotion of personal protection methods (including the use of insecticide impregnated bednets or curtains), the promotion of special drug treatment programs to protect high risk groups, and the exploration of methods of cost recovery for health services as appropriate.

d. Provide special funding for NGOs working at district and more peripheral levels to develop new approaches to malaria prevention and control. In addition to cooperating with the District Health Team as appropriate in the implementation of malaria control program activities, funding will be available to permit operations research in several areas where NGOs have good local expertise and the flexibility to develop and test new approaches to malaria control:

1). Operations research in the **promotion of insecticide impregnated bednets.** NGOs may be particularly well placed to conduct operations research into methods by which households will be willing to purchase bednets at their real value. They may also be able to help answer practical questions such as the best sizes, how to avoid damaging the net, and how people who do not sleep on true beds can use the nets.

2). Operations research in **local financing of health services.** Since government health units are constrained from testing systems to recover costs of health services from the community, the NGOs are in a position to do important in this area. Given the financial problems of the MOH, it is likely that some form of cost recovery will have to be implemented sooner or later. NGOs can perform a valuable service in helping to determine what form such a system should take in Malawi.

3). **Operations research in training, health education, supervision, monitoring, and community participation.** NGOs should be able to help to develop improved methods of promoting healthy practices and in managing health delivery services.

Limited funded will be provided to assist them to do so. It would be hoped that some of the new approaches developed by NGOs could be employed more widely, perhaps even in the public sector in the future.

5. Support the design and implementation of a national campaign to introduce Sulfadoxine-Pyrimethamine (S-P) as the first line drug for treatment of presumed malaria in Malawi.

1). **Provide technical assistance, management support, and funding to plan and execute a coordinated "launch" of this new product.** The package of services will include a public education campaign using mass media, a health worker campaign to train health workers in proper diagnosis and treatment, and a special management effort to assure that necessary stocks of S-P are widely available for the launch.

2). **Contract with a private sector marketing or management firm** to design and coordinate the launch, with technical advice provided by the Ministry of Health and the National Malaria Advisory Committee.

3). There will be **five components** of the launch effort:

- **The product**, with appropriate packaging, an educational insert, and a visual insert for non-literate users.

- **Distribution** -- a special, one-time effort to assure that adequate stocks of S-P are available at the time of the launch.

- **Health worker training**, following development of a comprehensive set of educational materials including treatment guidelines, curricula for various categories of health care personnel, visual aids, and patient educational materials. Clinical Officers at District level will conduct the training.

- **Mass media campaign aimed at the general public**, with messages, approaches, and materials designed, tested, produced, and implemented to carry out a major media campaign to introduce S-P to Malawi. Included will be a distinctive logo for S-P, radio spots, posters, magazine ads, newspaper articles, and other efforts. Exposure and coverage will be evaluated.

- **Overall management and coordination** of the above elements will be funded by this amendment.

D. Project Amendment Management and Procurement Plan

III. REVISED COST ESTIMATES AND FINANCIAL PLAN

A. RESEARCH ACTIVITIES - ILLUSTRATIVE BUDGET

Support continued applied research by CHSU, primarily through the Mangochi research station, to guide the malaria control policies in Malawi.

- Expand the existing facilities/capabilities of CHSU at the Mangochi Research Station, integrating to the extent possible with the District Hospital Laboratory and the Community Medicine program of the Malawi Medical School at Mangochi:

Construct laboratory/temp. housing facilities	$ 160,000
Laboratory equipment for CHSU/Mangochi	100,000
Operating costs for CHSU/Mangochi	52,000

- Provide the salaries for one Laboratory Technician and two Laboratory Assistants on a decreasing scale (100% for the first year, 75% for the second year, 50% for the third year, and 25% for the fourth year):

Salaries for a limited core staff	18,000

- Support applied research, the results of which will have a significant impact on malaria control in Malawi. All necessary salaries, supplies, and technical assistance will be supplied in the research budget.

a) 24 mo. long term TA for WHO bednet study	300,000
b) 1 mo. each short term TA for 3 other studies	37,500
c) Operations expenses for 3 other studies	100,000

- Support the development of entomological expertise within the NMCP by training a student to the M.Sc. level in medical entomology.

Two years of tuition and expenses	80,000
TOTAL	**$ 847,500**

B. HEALTH SERVICE DELIVERY ACTIVITIES - ILLUSTRATIVE BUDGET

Reinforce health service delivery systems within Malawi to assure appropriate malaria prevention and treatment throughout the country by strengthening the capacity of regional, district, and peripheral health teams to commit greater energy and resources to malaria control at the service provider level.

Activities for country-wide application:

Develop curricula and materials for malaria training:	
TA (3 months)	$ 37,500
Materials	30,000
(NOTE: Other PHICS funds may supply TA.)	
Develop health education approaches and materials:	
TA (2 months)	25,000
Materials	30,000
(NOTE: Other PHICS funds may supply TA.)	
Malaria information by newsletter every 6 months:	
Operations	15,000
Quality control system for laboratories:	
TA (1 month)	12,500
Operations	40,000
Develop passive monitoring of S-P use:	
TA (2 months)	25,000
Operations	50,000

Activities to be carried out in selected districts:

In-service training	400,000
Health education and community participation	150,000
(NOTE: Other PHICS funding may be available.)	
Monitoring and supervision	500,000
Operations research	300,000
TOTAL	**$ 1,615,000**

C. CAMPAIGN TO LAUNCH S-P - ILLUSTRATIVE BUDGET

Support the design and implementation of a national campaign to introduce Sulfadoxine-Pyrimethamine (S-P) as the first line drug for treatment of presumed malaria in Malawi.

- Intensive radio campaign production of 3 different spots	$ 50,000
- Consultant to prepare health worker training materials, handouts, visuals	20,000
- Health worker training	20,000
- Posters and other promotional materials	5,000
- Coordinator/monitor of drug distribution	5,000
- Management/Marketing Consultants to lead, coordinate efforts	25,000
- ODCs, fees, etc. (20% of total)	25,000
TOTAL	**150,000**

D. PHICS PROJECT AMENDMENT MALARIA COMPONENT - ILLUSTRATIVE BUDGET (US Dollars x 1000)

Item: \ Budget Line:	Constr.	T.A.	Training	Commod.	Operat.	Eval.	TOTAL
1. Change management		(a)			(a)		-0-
2. CHSU/Mangochi and applied research:							
a. Building	160						
b. Equipment				100			
c. Operations/salaries					70		
d. Research studies		337.5(b)			100		
e. Entomologist			80				847.5
3. Health service delivery:							
a. Management changes							
b. Country-wide:							
i. curricula/matls.		37.5		30(a)			
ii. health education		25		30(a)			
iii. newsletter					15		
iv. lab quality control		12.5			40		
v. monitor drug		25			50		
c. District level:							
i. training			400(a)				
ii. health education			150(a)				
iii. monitoring/superv.					500		
iv. operations research					300		1615
4. NGO support					300		300
5. Launch S-P campaign		54	24	6	66		150
Contingency							291.2
TOTALS:	160	491.5	654	166	1441		3203.7

NOTES: (a) PHICS funding available or potentially available to provide this.
(b) CDC PASA funds potentially available to provide this.

ATTACHMENT A

Strategies for the Development of National Malaria Control Programs, Brazzaville, 1991

Short term (1-2 years) strategies:

1) Designate malaria control as the highest national health priority.
2) Establish /strengthen malaria control units.
3) Stratify the country by intensity of malaria transmission.
4) Develop national malaria policies and plans.
5) Form national malaria advisory committees;
6) develop guidelines for the treatment, chemoprophylaxis, vector control, and training and research.
7) Order antimalarial drugs.

Medium term (2-5 years) strategies:

1) Establish/strengthen epidemiological surveillance systems.
2) Develop supervision and management plans to ensure drugs and supplies are available.
3) Develop patient education plans to assure families know what to do with a member ill with malaria.
4) Develop systems for local participation and management at the village level.
5) Establish quality control for antimalarial drugs and ensure they are properly labeled.
6) Establish an operational research program.
7) Determine the efficacy and feasibility of using insecticide treated bednets.

Long term (5-10 years) strategies:

1) Strengthen the entomological capabilities.
2) Assess the importance of urban malaria.
3) Integrate specially trained malaria control staff into the peripheral health system.
4) Extend surveillance into several sentinel communities.
5) Publish current information.

Project Name : **PHICS MALARIA AMENDMENT**

Est. Completion : **1997**
Date of Revision: **8/1992**
Design Team : **HOLLISTER, LANDRY, SONNEMANN**

Narrative Summary (NS)	Measureable Indicators (OVI)	Means of Verification (MOV)	Important Assumptions
Goal: 1 To improve the health status of Malawians by strengthening malaria control programs.	1.1 Reduce mortality rates due to acute and chronic malaria particularly in children under five and pregnant women.	1.1 MOH Health Information System.	(goal to supergoal) 1.1 Malaria has a significant impact on health.
	1.2 Reduce the malaria case fatality rate.	1.2 MOH, hospital records.	1.2 There are effective measures for the control and treatment of malaria in Malawi.
	1.3 Reduce the incidence of low-birth weight infants.	1.3 Special studies and surveys	1.3 Malaria is a significant cause of low-birth weight and the rates of low-birth weight caused by conditions other than malaria remain unchanged.
Purpose: 1 To identify appropriate methods of preventing malaria in Malawi and incorporating them into the national malaria control strategy.	1.1 Operational research to identify appropriate stategies for preventing malaria in Malawi is completed.	1.1 Reports to the national malaria management team, the national malaria advisory committee, and U.S.A.I.D.	(purpose to goal) 1.1 Effective measures to prevent malaria in Malawi are feasible and identified by operational research.
	1.2 Plans to implement preventive measures are incorporated into the national malaria control strategy.	1.2 Strategies at the district level include activities for the prevention of malaria.	1.2 Local populations will practice preventative health care if it is understood and affordable.
2 To assure prompt and accurate diagnosis and treatment of malaria.	2.1 80% of cases of fever presenting at health facilities are properly diagnosed and treated.	2.1 Supervisor's records at the district level and special studies and surveys.	2.1 Adequate logistical systems, and accesible knowledge and skill are in place to ensure health care providers can perform their jobs.
	2.2 40% of treated cases of malaria are appropriately followed.	2.2 Supervisor's records and special studies.	2.2
	2.3 At least 60% of referred cases of complicated malaria are appropriately handled.	2.3 MOH hospital records.	2.3
	2.4 75% of mothers take appropriate action within 24 hours of the onset of a child's fever.	2.4 KAP studies.	2.4 Mothers will take the appropriate actions if resources are available and they understand its significance.

Outputs:			(output to purpose)
1 Program management focuses on service delivery.	1.1 A Malaria Control Management Team is constituted and meets regularly to guide and monitor the compliance with and effectiveness of the national malaria control guidelines.	1.1 Meeting minutes indicate quarterly meetings of the Malaria Control Management Team. Supervisory reports and special surveys.	1.1 The Malaria Control Team is empowered to promote and implement malaria control activities throughout Malawi.
	1.2 The latest guidelines for malaria prevention and treatment are available in 95% of health facilities.	1.2 Supervisors' reports and special surveys.	1.2 HIS malaria statistics are available from the districts in a timely fashion.
	1.3 Semi-annual information newsletter is produced and distributed to 90% of the health units.	1.3 Special surveys and health facility inventories.	
2 Research capability to guide malaria control policies is maintained.	2.1 The CHSU research facilities at Mangochi are built and equipped.	2.1 Site visits and MOH financial reports.	2.1 The MOH is willing to commit resources to maintain the applied research program.
	2.2 Three individuals are hired and increasingly supported by the MOH to be core laboratory staff in Mangochi.	2.2 MOH financial and employment records.	
	2.3 Studies are completed to: 1) determine bednet efficacy, 2) monitor S-P efficacy, 3) review the presumptive diagnosis of malaria in Malawi, and 4) monitor malaria vector biology changes in Malawi.	2.3 Reports to the national malaria management team, the advisory committee, and U.S.A.I.D.	
	2.4 MOH staff member earns M.Sc. in medical entomology and returns to MOH employment.	2.4 MOH employment records.	
3 Regional, district and peripheral level health teams have increased capacity to deliver malaria control services.	3.1 All district teams have plans of action for malaria contol.	3.1 Review of district action plans	3.1 The District teams have the resources and capabilities to develop (with the help of the national malaria advisory committee), implement, and monitor malaria control activities within their districts.
	3.2 District teams conduct training in accordance with their action plans, retraining at least 80% of health workers.	3.2 Distict reports and financial records, field surveys of training coverage.	
	3.3 District teams monitor and supervise malaria control activities within their districts.	3.3 Supervisors' records and reports.	

	3.4 District teams conduct operational research.	3.4 District reports to the malaria control management team.	
	3.5 All district teams implement programs in health education and community participation.	3.5 KAP studies.	
4 NGOs have the capacity and opportunity to contribute to malaria control activities in their districts.	4.1 NGOs participate at district level in the management of malaria control activities.	4.1 District reports to the malaria control management team and NGO progress reports to U.S.A.I.D.	4.1 The priorities of the NGOs are consistent with the district's malaria control strategy.
	4.2 NGOs conduct operations research.	4.2 Progress reports to U.S.A.I.D.	4.2 NGOs have the capacity to conduct effective operational research.
5 S-P is effectively launched to replace chloroquine as drug of choice for the treatment of malaria.	5.1 S-P is available in all health units and appropriate retail outlets.	5.1 Drug inventories.	5.1 Central Medical Stores can maintain and distribute sufficient supplies of S-P.
	5.2 80% of health workers prescribe S-P properly.	5.2 Supervisors' records.	
	5.3 50% of Malawian adults are aware of S-P and its proper use.	5.3 KAP studies.	
Activities: 1.1 Assemble a malaria control management team to include: a) a full time manager from health services delivery, b) a representative of CHSU and the malaria advisory committee, and c) the malaria control managers from the three regions. 1.2 Assist to publish and distribute revised guidelines for malaria prevention, diagnosis, and treatment. 1.3 Assist to publish a semi-annual malaria control newsletter and to distribute to all health care providers. 2.1 Help to expand and equip CHSU research facilities (Mangochi and Lilongwe). 2.2 Support applied research staff and operating expenses on a decreasing scale.	Inputs/Resources: Budget in thousands: 1.1 Cost covered in PHICS 1.2 Cost covered in PHICS 1.3 $ 15.0 2.3 [illegible]7.5 2.4 80.0 3.1 250.0 3.2 400.0 3.3 500.0 3.4 300.0 3.5 150.0 4.1&2 300.0 5.1 150.0 Contingencies (10%): 291.0 TOTAL $3203.5	1.1 USAID audits and evaluations 1.2 U.S.A.I.D. financial and progress reports 2.1	(activity to output) 1.1 2.1

2.3 Support applied research to include; a) WHO/ Mangochi bednet study, b) monitoring S-P efficacy, c) assessment of the reliability of presumptive malaria diagnosis in Malawi, and d) monitoring for changes in the biology of malaria vectors. 2.4 Support the training of a medical entomologist to the M.Sc. level.	Budget ($000) Construction 160.0 Technical Assistance 437.5 Training 630.0 Commodities/Eqmt 100.0 Operating Expenses 1585.0 Evaluations & Audits 0 Contingencies 291.0 TOTAL 3203.5		
3.1 Support the development of district malaria control action plans. 3.2 Assist the districts to conduct training in accordance with their action plans. 3.3 Support districts in monitoring and supervising malaria control. 3.4 Support operations research at district and local levels. 3.5 Assist the districts to develop malaria control health education and community participation.		3.1	3.1
4.1 Support NGO participation in malaria control at district and local levels. 4.2 Support operations research by NGOs.		4.1	4.1