

PN HRP-760

84037

**SERVICE QUALITY ASSESSMENT
SERIES**

MALARIA TREATMENT

**A REVIEW OF EXPERIENCE
IN FOUR COUNTRIES**

June 1991

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Agreement # AID/DPE-5920-A-00-5056-00

PREFACE

Since 1985 PRICOR¹ has assisted Ministries of Health and private groups in 12 developing countries² to systematically analyze the delivery of child survival services at the periphery. Depending upon local priorities, these systems analyses have examined one or more of six essential child survival interventions: oral rehydration therapy (ORT), growth monitoring, immunizations, the treatment of acute respiratory infections, malaria, and maternal care. For each intervention, the studies have analyzed service delivery and critical support systems at the periphery: in homes, at the community level, and at first-line health facilities. These systems analyses have employed direct observation and systematic quantification of task performance, using measurement instruments derived from the PRICOR Primary Health Care Thesaurus, a detailed compendium of significant health worker tasks. By documenting specific areas of strength and weakness in service delivery and support activities, the analyses enable the health manager to identify operational problems and target corrective actions more precisely. Accordingly, systems analyses have been followed, in most cases, by problem solving operations, research studies, or administrative adjustment.

This report is one of a series of PRICOR service quality assessments based on systems analyses and operations research studies. This series presents comparative reviews of results from these analyses that document multi-country program experience, using standardized task definitions and measurement techniques more precise than previously thought possible. The results add significantly to knowledge of program operations and their common problems. The objective of this report series is to identify operational problems commonly faced by primary health care and child survival programs as well as to describe solutions that PRICOR-supported district managers and supervisors have devised and tested for improved quality of care. While country programs are discussed alongside each other, the objective is not to evaluate relative performance, but rather to illustrate international variations and shared problems.

Reflecting the structure of the thesaurus, the comparative framework employed in this report on malaria treatment focuses on clinical assessment, treatment, patient counseling, and health education. Also reviewed are three essential support services for malaria treatment: logistics, supervision, and training. To the degree feasible, all of the essential tasks that must be correctly performed to carry out malaria treatment are enumerated and performance variants described.

This report and others in the Service Quality Assessment Series summarize findings from systems analyses within PRICOR's comparative framework. Comments on the series are invited and should be submitted to Dr. Jeanne Newman.

¹ The PRICOR (Primary Health Care Operations Research) Project is operated by the Center for Human Services (Bethesda, MD, USA) for the United States Agency for International Development.

² Colombia, Costa Rica, Haiti, Indonesia, Niger, Pakistan (Punjab and Northwest Frontier Province [Regi]), Peru, Philippines, Senegal, Togo, Thailand, and Zaire.

ACKNOWLEDGEMENTS

Recognition is given to the host country field staff who served as principal investigators in the country studies in Niger, Pakistan (Northwest Frontier Province and Punjab Province), Senegal, and Zaire. We also express our gratitude to Dr. James Heiby, PRICOR Project Officer, AID/S&T/Health, whose close collaboration and intellectual input were integral to the success of this research.

EXECUTIVE SUMMARY

Service Quality Assessment of Malaria Treatment

A Review of Experience in Four Countries

More than half the world's population live in areas where malaria is still a very real risk. Each year, about 270 million people become infected with the malaria parasite, and 110 million actually become ill with symptoms of the disease. Malaria continues to be one of the major killers of children in Africa and contributes to morbidity throughout much of the world. Chloroquine has provided a safe, inexpensive, and effective treatment for malaria. Although the push to eradicate malaria has been abandoned in most countries, much progress has been made in making chloroquine available. Prices have dropped substantially in recent years, and many countries are producing chloroquine tablets locally. However, increasing parasite resistance to chloroquine is becoming widespread, requiring more careful use of drug therapy. Effective treatment of malaria requires health workers to be proficient in diagnosis, dosages, and counseling.

The Primary Health Care Operations Research (PRICOR) Project has developed an approach to assessing the performance of health workers. This approach, termed systems analysis, uses a systems framework to document how service delivery and essential support services are actually being carried out. PRICOR, in collaboration with Ministries of Health, conducted five systems analyses in four countries on malaria treatment: Niger, Pakistan (Northwest Frontier Province and Punjab Province), Senegal, and Zaire.

PRICOR's systems analyses focused on systematic observation of health workers performing clinical assessment, treatment, counseling, and group health education tasks for malaria case management. In addition, exit interviews were conducted in some countries to verify whether mothers understood what they had been told. Support activities, such as logistics, training and supervision, were also reviewed, through observation, record reviews, and interviews with health workers and supervisors. In some studies, household surveys were also conducted with community members to determine general levels of health knowledge and practice.

Even though there were some differences in the types of workers observed, sampling strategies, and data collection methods among these five systems analyses, it has been possible to identify some common areas of strength and weakness in malaria treatment, and to suggest ways in which the quality of some of the components might be improved.

The strengths found fairly consistently across all programs included:

- Most health centers had chloroquine in stock.
- Supervisors were visiting health workers (except in Niger).
- Most clinic-based health workers had received training in malaria within the past 3 years.

- Most community-based and clinic-based health workers were prescribing chloroquine for the fever cases they encountered, and many explained to patients/mothers how to take the drugs.
- Many mothers knew about malaria, its danger signs, and the need to complete treatment.

These strengths reflect efforts made by Ministries of Health and international organizations to bring malaria treatment to the people by incorporating malaria activities into the PHC systems.

However, some important problems were also revealed in these five systems analyses:

- Health workers' clinical assessments were generally cursory, especially among community-based workers. As a result, case management based on assessment of fever origin was uncommon.
- Clinic-based workers in Pakistan did not routinely request blood slides before treating presumptively, as called for by the local treatment protocols.
- Treatment dosages were not standardized, and were often wrong.
- Health workers were not communicating to mothers the need to finish the malaria treatment and the danger signs indicating the need to return for followup.
- The supervision system was not addressing the above deficiencies.
- Community-based workers were not receiving refresher courses.
- Community-based workers were experiencing problems in maintaining chloroquine stocks at village level.

Observed performance for clinical assessment by community-based workers was generally poor: village health workers in Niger asked no questions in 35% of cases and did no physical exam in 65%. In the Punjab (Pakistan), for the 150 fever cases detected, 63% were asked no questions beyond the presence or absence of fever. Even clinic-based workers were not generally thorough in their history and physical exam. Identifying the origin of the fever is important to assure correct treatment. Even in areas where all fevers in children under 5 and pregnant women are to be treated with chloroquine, it is crucial to assess and treat other possible causes as well. Inadequate assessment leads to both overtreatment for malaria and lack of treatment for other ailments. It would appear that health workers often abide by the patient's assessment of fever and accept malaria as the diagnosis, without really exploring the possibility of other causes.

Results from many of the systems analyses showed that counseling of patients/mothers was weak. Health workers are not making sufficient effort to provide the key messages about the importance of completing treatments and the danger signs that indicate the need for followup. Malaria, with the increasingly widespread resistance to chloroquine, is becoming more difficult to treat. It therefore becomes more important that radical cures are carried out fully and that persistent fevers receive laboratory confirmation and/or alternative drug therapy.

Evaluation of the systems that support service delivery revealed weaknesses in logistics, supervision, and training. Although most countries have been able to provide supervision visits

and training sessions, the content and methods of supervision and training generally are not addressing the problems in worker performance. Systematic exchange of information and refresher training were identified as critical components of malaria programs. Although malaria treatments have been part of the health system's activities in these countries for a very long time, problems continue in providing correct dosages. Protocols have changed over time, but it seems that these changes are not being transmitted to workers in the periphery, where many different treatment protocols were observed.

Supervision did not focus on the technical aspect of malaria case management and rarely included observation of health worker performance. In Senegal, for example, supervisors overestimated performance, leaving them unable to identify problem areas and take action to improve performance. Yet, even when they were observing, supervisors tended to focus on the "treatment" aspect, leaving clinical assessment and counseling aside. Weaknesses in current supervision, logistics, and training efforts are reflected in the weaknesses seen in the clinical assessment, treatment dosages, and counseling aspects of malaria treatment.

One of the major outcomes of the individual country studies presented in this comparative review has been the use of results by local and national managers. PRICOR worked with these managers to address some of the problems. All four countries formulated small operations research studies to develop and test new strategies.

This comparative review brings together information on the performance of malaria services in a number of diverse settings. The results can help focus efforts at program improvement in the coming years. Integrating malaria treatment into the PHC system has increased access for much of the rural population. However, the results from these five systems analyses expose many quality-of-care problems. Two major areas of inadequacy are common across all countries studied, indicating that they are probably weak in other countries as well. This commonality argues for new efforts at strengthening these areas:

- clear protocols for clinical assessment and treatment, and
- technical supervision.

There is a need to develop simple protocols for clinical assessment of fever origin so that, by process of elimination, antimalarial drugs can be given only for fevers of unknown origin. There appears to be some ambiguity about the health worker's responsibility in searching for alternative diagnoses when faced with a patient with fever. This is especially true where antimalarials are to be given for all fever cases in young children and pregnant women. With increasing chloroquine resistance, health workers must use more expensive and toxic antimalarials. This, in turn, reinforces the need to limit antimalarial use to those cases which really need them.

Increasing parasite resistance to chloroquine also argues for instituting laboratory confirmation and referral facilities for "failed" treatments. Treatment protocols are also not clear, with many different dosages and durations of treatment being used in the same country. This means that more care needs to be taken in communicating current malaria protocols.

Finally, if the quality of malaria treatment is to be improved, more effort needs to be made to improve the supervision and training systems so that these protocols can be communicated and taught to workers already in the field, and to monitor how well they are able to implement these

protocols. This means that supervisors must be imparted with the skills and tools to identify problems in worker performance and to address them as they arise.

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1. INTRODUCTION: QUALITY ASSESSMENT OF MALARIA TREATMENT IN FOUR COUNTRIES

1.1 MALARIA IN THE CONTEXT OF PRIMARY HEALTH CARE

In 1987, over 1 million children under the age of 5 died from malaria (UNICEF, 1988),¹ and more than half the world's population live in areas where malaria is still a very real risk. Each year, about 270 million people become infected with the malaria parasite, 110 million of whom actually become ill with symptoms of the disease.² During the 1950's-1970's, malaria programs around the world attempted eradication of the disease through insecticide spraying, mass chemoprophylaxis, and drug therapy. Some success was acknowledged with this strategy, but effectiveness was generally dependent on maintaining these interventions over long periods of time to control re-introduction of the disease, and on isolation from other malarious areas without equally stringent control measures. In addition, resistance to insecticides has developed. Areas such as Sri Lanka have seen the resurgence of malaria in recent years.

Malaria parasites are transmitted from human to human via the bite of an infected anopheles mosquito. Symptoms often include high fever, headache, chills, and sweats. Serious cases can involve vomiting, convulsions, and coma. There are four types of malaria parasites: *falciparum*, *vivax*, *malariae*, and *ovale*. Distinction on the basis of clinical symptoms is difficult without laboratory examination. The *falciparum* parasite produces the most fatal form of malaria.³

Reducing malaria mortality through timely administration of appropriate treatment should be first priority for antimalarial action. In endemic areas, malaria infection may be a complicating factor in fever cases with other symptoms, and it has been recommended that antimalarials be given to children for all cases of fever, regardless of other treatments given.⁴ However, more recently WHO has stated that implementation of this recommendation should reflect local epidemiological patterns: instead of a national policy, it should be instituted only in areas where risk of infection is high. Otherwise, patients are excessively exposed to potentially toxic antimalarial drugs.² Chemoprophylaxis in children under 5 in endemic areas is no longer recommended, due to the difficulties in maintaining adequate coverage, the toxicity of accumulating chloroquine in the tissues, and the possibility that irregular chemo-suppression accelerates resistance.⁵

Chloroquine has been the drug of choice for many years, due to its low toxicity and low cost of production. However, treatment of malaria has become increasingly difficult: the *falciparum* parasite has become progressively more chloroquine-resistant in Southeast Asia and South America, and now in Africa. Where resistance is suspected, microscopic diagnosis may be necessary,³ especially as the *ovale*, *vivax*, and *malariae* parasites continue to respond to chloroquine. This laboratory confirmation allows use of chloroquine when appropriate. Alternative antimalarial chemotherapies, such as sulphadoxine/pyrimethamine and mefloquine, are more toxic and more costly (up to 33 times more expensive than chloroquine).⁵

The malaria situation and its control differ between those areas where malaria is stable and endemic malaria (Africa) and where it is unstable (Southeast Asia, Latin America)² :

- In areas which have high malaria prevalence, severe illness (much *falciparum* malaria) in children, and inadequate health infrastructure, the focus of malaria control programs is on treatment of suspected cases, especially in young children and pregnant women. This is the situation of stable, endemic malaria, and is found in much of Africa. Most malaria there is caused by the *falciparum* parasite. This is the most fatal for young children and non-immune adults, and has been shown to cause low birth weight for women with high parasite loads during pregnancy. Action in the case of malaria in high risk groups should focus on prompt life-saving treatment. Treatment in other groups (adults) could, however, simply endeavor to lower parasite density and relieve illness.
- In areas which have more unstable malaria patterns, less severe forms of malaria (more *vivax*, *ovale*, *malariae*), widespread resistance of *falciparum* to chloroquine, and often more developed health infrastructure, the focus of malaria activities is on more discriminant treatment, using laboratory confirmation to determine if the case is malaria and what type of parasites are the cause. Treatment aims to eliminate not only the overt disease, but also the infecting parasite.

Although the push to eradicate malaria has been abandoned in most countries, much progress has been made in making chloroquine available. Prices have dropped substantially in recent years, and many countries are producing chloroquine tablets locally. However, in Africa, chloroquine is often widely available through the uncontrolled commercial channels. This, combined with inadequate guidance on appropriate doses and treatment schedules, encourages the use of insufficient doses which relieve clinical symptoms but exert a high selection pressure for drug resistance.⁵

In almost all countries, government policy calls for malaria treatments to be provided solely by trained health workers, be they nurses, doctors, or community health workers. One important aspect of assuring the quality of malaria services involves knowing whether malaria care is performed inadequately by health personnel or by the mother after having consulted the health worker. Malaria programs often have information only on the number of antimalarial drugs distributed, homes visited, treatments given, or laboratory tests performed. The process of care itself is usually like a "black box," leaving health service managers with little information to help understand specific service delivery problems that may require solving. Treating malaria has become increasingly more difficult as chloroquine resistance spreads. The need for appropriate diagnosis and treatment calls for quality assurance mechanisms which can identify problems and develop solutions.

1.2 ASSESSING QUALITY OF CARE IN MALARIA PROGRAMS: THE PRICOR APPROACH

The Primary Health Care Operations Research (PRICOR) Project has developed an approach to assessing the performance of health workers in order to shed light on what goes on inside the "black box." This approach, termed systems analysis, uses a systems framework to document how service delivery and essential support activities are actually being carried out. It visualizes the production and utilization of health services as a series of interrelated activities which use inputs (resources) to produce outputs (services) via a process. These outputs in turn produce outcomes (improvements in health status). Since much information is already available on resources and outputs, the PRICOR systems analysis has focused on process: how resources are transformed into services. Systems analysis examines what health workers are doing and how they are doing it. The systems analysis provides information necessary for the identification of specific service

delivery problems or obstacles to the implementation of quality care. Following the systems analysis, corrective action may be taken, or if appropriate, operations research (OR) may then be used as a tool for determining what actions are best suited for strengthening these services.

Since 1985, PRICOR has worked with 12 developing countries to document and analyze primary health care (PHC) and child survival service delivery in order to identify and resolve problems through direct action or through OR studies. Systems analyses of malaria activities were carried out in 4 of the 12 countries: Niger, Pakistan,⁶ Senegal, and Zaire. In addition, 14 operations research studies have been or are being conducted on aspects of malaria service delivery. This report presents results of these systems analyses and the operations research studies undertaken by local managers to address problems identified through these analyses.

1.3 THE MALARIA TREATMENT SYSTEM

The malaria treatment system can be described as a set of activities to be carried out to provide early and complete treatment for malaria cases, in order to avoid deaths and malaria-induced low birth weight. Within the malaria service delivery system are a series of smaller subsystems: case management, health education and counseling, planning, training, supervision, logistics, community organization, financial management, and information. Each subsystem consists of a set of activities. Together, these subsystems interact to produce outputs (treatments and/or knowledgeable mother) and to reduce complications and deaths.

Figure 1.1 depicts a model of the malaria treatment system: at the entrance to the system is the mother or caretaker who recognizes fever in her child. She may then either treat the child at home or take the child to a health care provider. For the health care worker to provide appropriate case management, he or she must take a medical history and do a physical exam. This information allows the health worker to assess the origin of the fever (differential diagnosis). He or she may also perform laboratory tests to confirm the diagnosis. The clinical laboratory assessment process helps the health worker prescribe the appropriate treatment. The health worker also must provide counseling to the mother or patient on followup treatment and prevention of malaria. The mother in turn must understand, accept, and carry out the activities required for effective case management in the home (completion of treatment and recognition of danger signs which could indicate a failed treatment due to parasite resistance or another cause of the fever). A treatment correctly prescribed and administered should lead to a regaining of health and reduced malaria mortality.

1.4 SYSTEMS ANALYSIS METHODOLOGY

The systems analysis methodology consists of breaking down the above activities into observable tasks and subtasks, identifying appropriate indicators of their performance, and measuring their implementation in order to detect problems in quality of care. Based on staff experience, expert opinion, and WHO guidelines, PRICOR developed a thesaurus for seven child survival interventions, including treatment and prevention of malaria. The thesaurus contains a list of tasks and subtasks for each activity, indicators for the measurement of their performance, and suggested information sources. Table 1-1 presents a list of general activities comprising the malaria treatment system, based on the PRICOR Thesaurus.⁷ The appendix contains part of the thesaurus chapter on malaria, showing the tasks and subtasks involved in the activities listed in Table 1-1.

Figure 1.1
MALARIA TREATMENT SYSTEMS MODEL
PROCESS

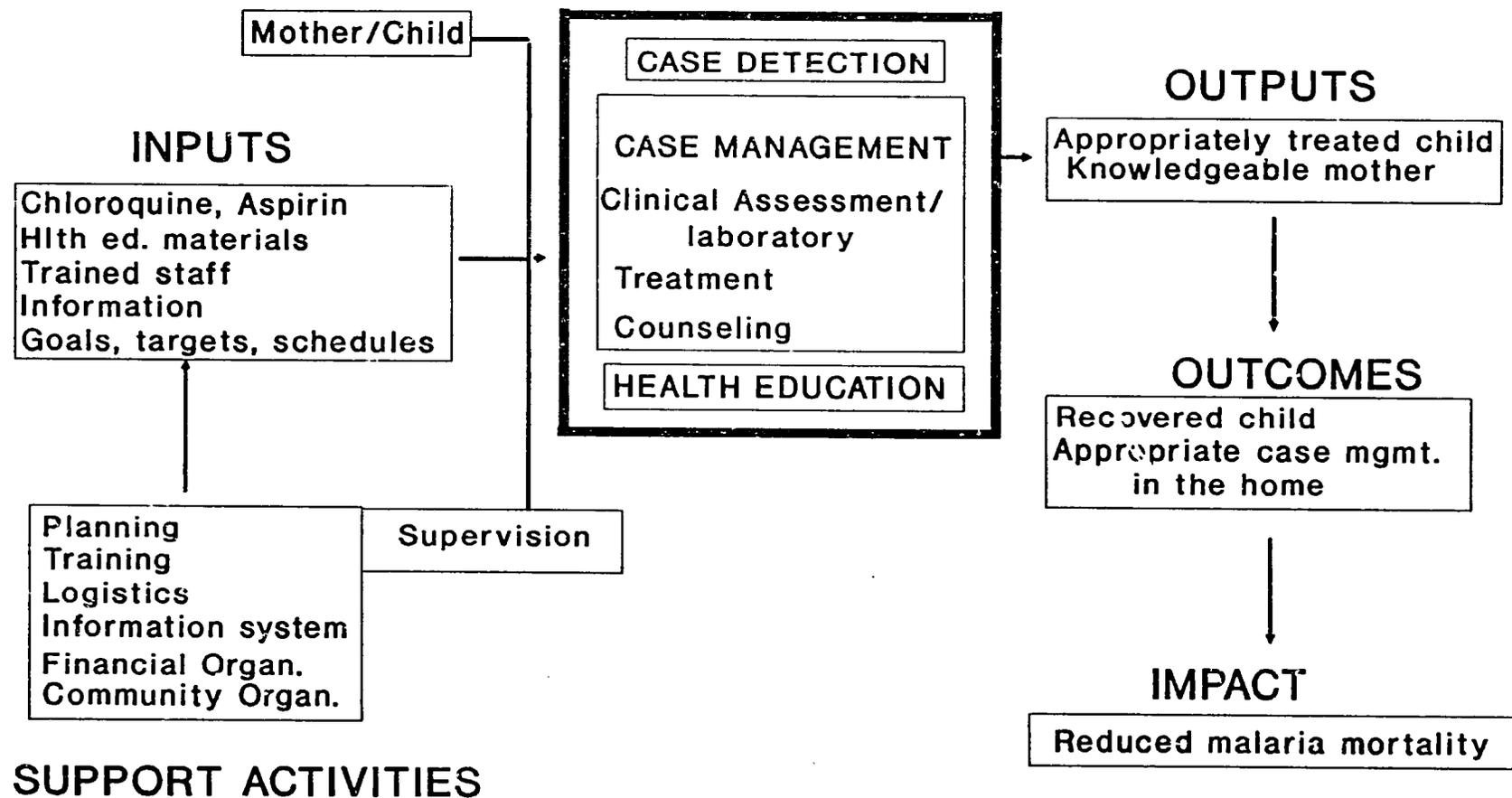


TABLE 1-1

COMPONENTS OF THE MALARIA TREATMENT SYSTEM

SERVICE DELIVERY

Case Management

- make clinical assessment and laboratory exam
- administer appropriate treatment (or referral)
- provide counselling

Motivation and Education for Mothers and Other Community Members

- transmit key messages and skills through group education, home visits, etc.
- use appropriate counseling techniques and methods

SUPPORT SERVICES

Planning

- set malaria objectives
- set targets (specify age groups, desired coverage, etc.)
- develop malaria strategy
- develop malaria procedures, budget, workplan

Training

- plan training
- transmit key malaria information and skills
- use appropriate training methods and materials
- test students' competence
- evaluate training

Logistic Support

- plan logistic support
- procure chloroquine, laboratory equipment, and supplies
- store chloroquine and laboratory supplies
- distribute chloroquine, laboratory equipment, and supplies
- maintain inventory records

Supervision

- plan supervision activities
- supervise service delivery (assess malaria task performance, provide feedback, solve problems, motivate workers)

Information Systems

- maintain records on malaria service delivery, support activities, size of target population
- conduct special malaria KAP, coverage, and impact studies
- process data, report information, and use for program planning, monitoring, problem solving

Financial Management

- budget and obtain resources budgeted for malaria activities
- generate local resources (e.g., user fees)
- disburse and account for funds used and received for malaria activities

Community Participation

- motivate community leaders and members to participate
- determine desired role of community in malaria activities
- develop community capacity to participate in or undertake malaria activities
- establish schedules and workplans
- monitor activities.

The PRICOR Thesaurus provided the basis for selecting indicators of malaria service quality and developing data collection instruments in the five systems analyses that covered the treatment of malaria. Although the actual application of the systems analysis methodology differed somewhat among the countries, all applied the basic PRICOR systems analysis methodology which starts with identifying primary health care/child survival subsystems and geographic areas of principal interest. The Ministry of Health, AID missions, or other responsible agencies, in collaboration with PRICOR, developed criteria for the selection of localities and facilities and selected a sample of health facilities for study. Given the limitations of resources and time, representative regions of the country were chosen, and bracketed sampling was used to include the best and poorest performing health centers and health posts within these regions. Assessing the centers which perform better would identify problems, not only in those centers, but also throughout the whole system.

PRICOR staff and their local country counterparts developed data collection instruments to document what was actually happening in the delivery of primary health care/child survival interventions. These data collection instruments focused on the systematic observation of health workers performing their PHC activities and tasks. For malaria, this meant observing outreach for case detection, clinical and laboratory assessment, treatment, counseling, and health education. In addition, exit interviews were conducted in some countries to verify whether mothers understood what they had been told. Support activities, such as logistics, training, and supervision, were also assessed, through observation, record reviews, and interviews with health workers and supervisors. In some studies, household surveys were also carried out to determine general levels of health knowledge and practice; in some cases these interviews have also served to gauge whether findings about mothers' knowledge about malaria from exit interviews were generally representative of the rest of the population in the area.

PRICOR staff and national counterparts processed and analyzed data to identify problems. The results of the systems analysis, usually in the form of frequency distributions and charts, were then presented to health officials and managers during workshops. Also during these workshops, managers identified corrective action. In some cases, administrative action was indicated. In others, brief, inexpensive, highly focused operations research studies were undertaken to further understand the problem and/or test alternative solutions.

1.5 FIVE SYSTEMS ANALYSES ON MALARIA TREATMENT

Four countries have conducted systems analyses on malaria treatment and prevention: Niger, Pakistan (Raj and Punjab), Senegal, and Zaire. The approach to malaria control is quite different in the African countries than in the Asian countries. In Africa, malaria is stable and endemic, with health infrastructures generally less well developed. These three African countries are all focused on presumptive treatment based on clinical diagnosis. In Asia, the focus is more on case detection by outreach workers, laboratory confirmation, and treatment, due to the unstable nature of malaria in the region and more widespread resistance of *falciparum* parasite to chloroquine.

Although the five malaria systems analyses considered in this review followed the same broad systems analysis methodology, there were variations in its application. Depending on the structure of the specific health system being analyzed, these differences affected how data could be collected and, in some situations, created difficulties for accumulating data on sufficient cases. Additional differences were caused by the modification and improvements in the methodology as

more systems analyses were carried out: later systems analyses were able to obtain information not available from earlier systems analyses. These differences restrict the possibilities of making quantitative comparisons among the five systems analyses. Following are brief descriptions of the five malaria studies, organized by geographic region.

1.5.1 SYSTEMS ANALYSES IN AFRICA

Three systems analyses were conducted in Africa, all in rural settings: Zaire, Senegal, and Niger. Two of these, Senegal and Niger, examined performance of community-based workers, and two examined clinic-based workers' performance (Senegal and Zaire).

ZAIRE (1987): The systems analysis in Zaire was carried out as part of an operations research component of the USAID Rural Health Project (SANRU). This project operates in nearly half the 304 health zones of Zaire. Four health zones were selected for the study in various regions of the country: three zones participating in the SANRU project and one zone that did not benefit from SANRU assistance. In each zone, the systems analysis team selected five health centers (staffed by nurses and auxiliary nurses): four for their estimated high performance and one for its low performance. The protocol for malaria activities consists of treating suspected fever cases (based on clinical diagnosis) and providing prophylaxis for pregnant women. Community health workers (CHWs) provide health education and some preventive activities related to environmental sanitation. The systems analysis team spent 2 days in each health center. During this time, they were able to make direct observations of a total of 57 spontaneous⁸ malaria treatments of children under 5 in the health centers. They observed four health education sessions where malaria was discussed. These health education sessions were generally given at the beginning of well-child outreach sessions. The systems analysis team accompanied five supervisors on a routine supervision visit. In these four zones, the systems analysis team also interviewed health center staff (N=48), village health workers (N=56), and members of community health committees (N=63). Household surveys were used to interview mothers with children under 5 (N=664).

SENEGAL (1989): The Senegal systems analysis was carried out under the auspices of PRICOR and the Ministry of Health. It focused on supervision of PHC activities, and included 5 of the 10 regions in Senegal: 2 in which USAID has been supporting PHC programs and 3 for comparison. Assessment was made of malaria treatment activities at both health post and village health hut level. Malaria treatment protocols are the same at both levels (chloroquine and aspirin), although health huts are restricted to tablets. Health posts are staffed by trained nurses, while health huts are staffed by semi-literate or illiterate community health workers (CHWs) who receive a 3-month training prior to beginning their work. CHWs are supervised by health post nurses, who are in turn supervised by departmental supervisors, and occasionally by regional supervisors. The systems analysis team went first to the villages to observe the service delivery activities of the CHW treating malaria cases at the health huts. Simultaneous observations were made of the CHWs' performance and of the health post nurse supervising service delivery by the CHW. The health post nurses were observed at a later date as service providers at their health posts, with simultaneous observations of their work and that of their departmental or regional supervisors supervising them. If a fever case was not present at the health post or health hut at the time of the observations, a member of the systems analysis team visited households to identify a fever case and asked them to visit the health facility. If no fever case could be found, a mother was asked to role-play with the health worker. For treatment of malaria, the systems analysis team observed 130 cases: 94 by male CHWs, 11 by female CHWs, and 25 by health post nurses. Eighty-eight percent

of the observed health post treatments and 63% of those at the health hut were for actual cases. For 78 of these treatments, supervisors were present at the time of treatment, and observations were made of supervisory performance as well. Supervisors were interviewed immediately after the observation of the encounter (N=73). Because the study was designed to have the supervisor present during a service delivery situation, the findings should not be construed to indicate that supervisors are "normally" observing service delivery. These data indicate a supervisor's skills in identifying problems when in the presence of a malaria case.

NIGER (1989): Working with the Ministry of Health, PRICOR conducted a systems analysis of the Village Health Worker (VHW) Program. This program supports a network of over 13,000 workers in 4,000 villages. The systems analysis took place in three provinces of the country, chosen on the basis of their representativeness of the economic and cultural diversity of the country. Three districts were then chosen in each province, to represent different contexts for VHW functioning, such as externally funded projects. A total of 54 village health teams were visited, chosen because they had at least one male and female VHW, and because they were farther than 10 kilometers from a dispensary. Village health teams ideally consist of two male workers and two traditional birth attendants, often all illiterate. Only male VHWs are to perform malaria treatments. Initial training lasts 15 days, in which they are taught malaria prevention, treatment with chloroquine and aspirin, and health education, as well as diarrhea, sanitation, nutrition, water hygiene, and MCH activities. Information on VHW performance for malaria was collected through observation of service delivery and exit interviews of mothers (N=81 fever cases). In circumstances where it was not possible to find spontaneous cases, male village health workers or health committee members were sent out to find fever cases. When no cases could be found, role-play was used; 12% of the 81 VHW-patient encounters observed were simulated. In some cases, when chloroquine was not available in the village, the systems analysis team provided it to the VHW in order to assess his ability to prescribe the correct dose. Also observed were 46 health education sessions on malaria, and 51 supervisory visits made by 27 supervisors (health post nurses). These supervisory observations did not coincide with the systems analysis team's observations of VHW performance. Supervisors were accompanied by the systems analysis team and asked to make "routine" supervisory visits. In none of the observed supervision visits was a malaria treatment encountered. The systems analysis team also interviewed male VHWs (N=84) and supervisors (N=27) about malaria activities. Information on mothers' knowledge came from a household survey interviewing 378 mothers with children under 5.

1.5.2 SYSTEMS ANALYSES IN ASIA (PAKISTAN)

In Asia, two systems analyses were conducted in Pakistan, in Regi (Northwest Frontier Province) and in Punjab Province. These systems analyses focused mainly on rural health services. In both Regi and Punjab, assessment was conducted of health worker performance in the clinic setting, and in the Punjab, active case detection by community outreach workers was assessed as well. Protocols for malaria treatment call for laboratory confirmation (via blood slides) of all suspected cases, and after taking the blood slide, starting presumptive treatment.

PAKISTAN—REGI MODEL BASIC HEALTH UNIT (1989): The first systems analysis in Pakistan was conducted at the model Basic Health Unit (BHU) at Regi village, Northwest Frontier Province (NWFP). The BHU is the lowest level health facility where comprehensive primary care can be obtained. The Regi model BHU was designed to experiment with ways of making the BHU more effective and responsive to the needs of the community. Although the model BHU at Regi is

representative of other BHUs with regard to physical facilities, equipment, supplies, and staffing pattern, staff and activities at the model BHU did receive additional interest and attention from Provincial and other health authorities. Accordingly, although all data refer to the operations of one BHU only and should not be taken as typical of other BHUs in the Province, it is reasonable to expect that health worker performance in other, non-model BHUs may be considerably weaker than that at Regi. The BHU was staffed by medical officers, medical technicians, and Lady Health Visitors (LHVs). The systems analysis included observation of 24 malaria treatments at the BHU, exit interviews with patients (N=23), household interviews with community members in the Regi catchment area (N=487), and interviews with health workers (N=6) and their supervisors (N=10).

PAKISTAN--PUNJAB PROVINCE (1989): The systems analysis in the Punjab Province in Pakistan grew out of the Provincial government's desire to assess utilization of rural health facilities and the effectiveness of multi-purpose primary health care outreach workers. The systems analysis, which was carried out in three districts, included observation of clinic-based management of malaria cases (N=194) at a sample of Basic Health Units (N=142 cases) and Rural Health Centers (N=52 cases). These health facilities were staffed by medical officers, medical technicians, and Lady Health Visitors (LHVs). Exit interviews were conducted with patients as they left the facility (N=112). Household interviews about knowledge and utilization for malaria treatments were conducted with villagers (N=1,313) in the catchment areas of the health facilities studied. In addition, multi-purpose health workers (MPHWs) were observed conducting outreach visits (N=852) to households in the same communities; 150 fever cases were detected. Supervisors of MPHWs were observed as they accompanied the multi-purpose health workers on visits to homes in the same communities (N=152), and they conducted supervisory meetings with those workers (N=36).

Table 1-2 presents a comparative framework for the types of data collection and sample sizes in the five systems analyses reviewed in this document.

1.6 OVERVIEW OF THE MALARIA COMPARATIVE REVIEW

This comparative review will focus mainly on service delivery activities (malaria case management and health education). The goal of this review is not to compare quality of care in one country with that of another. Rather, this comparative review will look for common themes and problem areas in hopes of promoting more attention to these areas in malaria programs around the world. Chapter 2 will present the results of observations of health workers from these five systems analyses, as well as data on mothers' knowledge from exit interviews and household surveys. Chapter 3 focuses on performance of support activities, such as logistics, supervision, and training. These support activities provide the key inputs to service delivery activities, and are important determinants of the quality of health worker performance. Chapter 4 discusses the strengths and weaknesses of malaria service delivery and support service performance that have been identified through the systems analyses. Chapter 4 also discusses what managers did with this information in these countries, and suggests future directions for improving malaria systems' performance.

Table 1-2
PRICOR SYSTEMS ANALYSES
TYPES OF DATA COLLECTION AND SAMPLE SIZES BY COUNTRY
FOR MALARIA TREATMENT

country type of worker	Africa					Asia		
	Niger CHW	Senegal CHW	Senegal Clinic	Zaire CHW	Zaire Clinic	Punjab CHW	Punjab Clinic	Regi Clinic
Observation of Health Worker Service Delivery (nb.of encounters)	81*	105*	25*	-	57	852^	194	24
Observation of Supervision (nb. of visits)	51	51	27	-	5	152^	-	-
Household Interviews	378	-	-	664	664	1313	1313	487
Exit interviews with Patients	81	-	-	-	-	-	112	-
Community Member Interviews	-	-	-	63	63	-	-	-
Health Worker Interviews	84	124	35	56	48	-	-	7
Supervisor Interview	27	35	57	16	5	-	-	10

- data not available

* Some malaria treatments were simulation/role-plays: Niger (12%); Senegal (CHW 37%, Nurses 12%)

^ Not all were malaria encounters

CHW = community-based worker

Clinic = Clinic worker

- 1 UNICEF, State of the World's Children (1988).
- 2 WHO, "Practical Chemotherapy of Malaria," WHO Technical Report Series, No. 805. Geneva: WHO (1990).
- 3 Communicable Diseases in Man, 15th Edition, 1990.
- 4 Kouznetsov, Molineaux, and Beasles, "Stratification of Malaria Situations in Tropical Africa for the Development of Malaria Control within the Primary Care Strategy." WHO/MAL/86.1028.
- 5 WHO, "WHO Expert Committee on Malaria, Eighteenth Report", WHO Technical Report Series, No. 735. Geneva: WHO (1986), and C.C. Draper et al, "Serial Studies on the Evolution of Chloroquine Resistance in an Area of East Africa Receiving Intermittent Malaria Chemosuppression," Bulletin of the World Health Organization, v.63, pp. 109-118 (1983).
- 6 In Pakistan, two separate systems analyses were conducted, making a total of five systems analyses reported in this comparative review on malaria.
- 7 Primary Health Care Thesaurus, Volumes I and II. PRICOR, Center for Human Services, Bethesda, MD.
- 8 "Spontaneous" refers to patients coming to the health worker/clinic of their own accord. No efforts were made to round up cases.

2. SERVICE QUALITY ASSESSMENT OF MALARIA TREATMENT

Service quality for malaria treatment has been assessed for detection of suspected cases, clinical assessment, treatment, counseling, and group health education. As described in the previous chapter, the types of workers observed, the sampling strategies, and the methods of data collection differed among these five studies. Nevertheless, even without statistical comparability, it is possible to identify some common areas of strength and weakness in the delivery of malaria services. Such an assessment helps to suggest ways in which the quality of some components might be improved. Quality of malaria treatments has been assessed through observations of health worker performance, interviews with patients, and household surveys.

It should be noted that observation data collected on health worker and supervisory performance may produce a picture of optimal worker performance: knowing they are being observed, workers and supervisors are probably performing at their best. Thus, the findings presented in this chapter and in Chapter 3 on supervision may even be an overestimation of routine performance.

As described in Section 1, an effective treatment of malaria involves: 1) detection of suspected cases, 2) clinical assessment, including laboratory testing, 3) administration of the appropriate treatment, and 4) counseling of the patient/mother about appropriate followup and home treatment.

2.1 CLINICAL ASSESSMENT AND DIAGNOSIS

Clinical assessment involves history-taking and physical exam, and in some countries laboratory confirmation, in order to reach a "diagnosis" of malaria. This clinical assessment serves to determine what is causing the fever, usually by excluding other possible causes of the fever. Clinical assessment also serves to determine the severity of the case, and to collect other information that would guide the health worker in determining what action to take, such as whether treatment was given at home prior to consultation.

2.1.1 SEARCHING FOR THE ORIGINS OF FEVER

Table 2-1 presents information from observation of health worker-patient encounters on history and physical exam as it relates to the identification of alternative sources of fever. This table shows health worker performance for individual items, as well as for groupings of items into categories for other possible causes of fever: diarrhea, respiratory ailments, meningitis, and other ailments (urinary, skin, or joint). It should be noted that not all systems analyses collected information on all items, and in Senegal, no information was collected relative to alternative diagnoses. The data in Table 2-1 indicate that health workers were not always thorough in trying to determine the possible causes of fever. Assessment of symptoms beyond fever was made in only 25% of cases seen by community-based workers in Niger and in only 1% of cases seen by outreach workers in Punjab.¹ Clinic-based workers performed better, but only in Zaire was performance relatively good. In 50% of all encounters, Zaire clinic-based workers conducted all five physical exam items (neck, abdomen, lungs, ENT, and skin). However, care should be taken when comparing the results of Zaire and Punjab clinic-based workers to those in Regi: differences in the number of alternative causes investigated could reflect the small number of items on which data were collected in Regi.

Table 2-1
Observations of Health Workers:
Searching for Other Causes of Fever
 (% of patient-health worker encounters where task was performed)

country type of worker nb. observations	Niger*	Zaire	Punjab	Punjab	Regi
	CHW	Clinic	CHW	Clinic	Clinic
	81	57	150	194	24
Asking: other symptoms					
-- Cough	4	61	-	50	-
-- Diarrhea	14	63	-	21	-
-- Sore Throat/Nose	2	43	-	21	-
-- Ear Pain	1	18	-	5	-
-- Joint Pain	1	0	-	7	-
-- Urinary Complaints	0	-	1	18	9
Examining: other signs					
-- Examine for Stiff Neck	2	55	-	6	-
-- Palpate Abdomen	6	82	-	18	-
-- Auscultate Lungs	NA	70	0	54	33
-- Examine Skin	-	54	-	7	-
-- Examine ENT#	2	72	1	31	29
Checked Other Causes					
-- Diarrhea	14	63	-	21	-
-- Respiratory Infections	6	88	1	83	33
-- Neck Stiffness	5	55	-	1	-
-- Other (Urin.,Skin,Joint)	7	84	1	46	9
Number Other Causes Searched For					
-- 0 Other Causes	75	2	99	10	67
-- 1 Other Cause	19	7	1	37	29
-- 2 Other Causes	5	30	0	42	4
-- 3 Other Causes	1	23	+	10	+
-- 4 Other Causes	0	38	+	1	+

- data not available

* Some treatments were simulation/role-plays: Niger (12%)

This includes any of the following: ear, nose, or throat

+ data not collected on further options

Checking for respiratory infections includes asking about cough, sore throat, ear pain, as well as examining ENT and auscultating lungs

Checking for other symptoms includes asking about urinary complaints, joint pain, examining skin, and palpating abdomen

2.1.2 ASSESSING SEVERITY OF THE ILLNESS

Table 2-2 shows health worker performance relative to the history and severity of the fever, previous treatment, and taking of blood slides. Determining signs of severe malaria involves evaluating the patient's temperature, and asking about vomiting and convulsions. With the exception of vomiting in Zaire, these questions were rarely asked (range: 1-37%). In Zaire, vomiting was an explicit criterion for the administration of injectable chloroquine. Temperature was evaluated in less than 60% of encounters, except by clinic-based workers in Senegal and Zaire (90%). For community-based workers, this could be due to the absence of a thermometer, although these results include tactile assessment. Questions about prior home treatment were also often left out, with workers at all levels asking less than 40% of the cases (range 4-40%). This information is important for assessing current levels of antimalarials in the bloodstream and avoiding prescribing what could be toxic doses. In some areas, such as Niger, this may be less important, since VHWs are generally the sole source of chloroquine for the village.

2.1.3 LABORATORY CONFIRMATION

In Pakistan, blood slides are supposed to be taken in all suspected fever cases. However, results in Table 2-2 show that clinic-based workers only had slides prepared (or read) ²in less than half the cases observed. This indicates that clinic-based health workers are relying on clinical assessment to diagnose malaria, contrary to norms.

2.2 DETECTION OF SUSPECTED CASES THROUGH COMMUNITY OUTREACH

In areas with unstable malaria epidemiology and drug resistance, some countries have taken an active approach to case detection. In Pakistan (Punjab), outreach workers are assigned to carry out door-to-door case detection. Case detection is based on the presence of fever, and blood slides are supposed to be made on the spot. Suspected cases are to be given initial presumptive treatment and referred to fixed facilities for laboratory confirmation and remaining treatment.

In Punjab, observation of multipurpose outreach workers (MPHWs) performing 852 home visits revealed that workers only asked about the presence of fever cases in the household 35% of the time. It is not known how many fever cases went undetected. For the 150 cases MPHWs did detect, they took blood samples in 87% of cases. They provided presumptive treatment in 48%. However, only 52% of those from whom a blood slide was prepared received treatment. Only 37% of fever cases were asked any history questions, and only one received any physical examination.

2.3 TREATMENT

According to the WHO Expert Committee on Malaria,³ appropriate treatment involves 25 mgs of chloroquine per kilogram of body weight, taken over 3 days. In the case of parasite resistance, other drugs are substituted, such as mefloquine or sulphadoxine-pyrimethamine.

Table 2-3 shows the data on observed treatments for fever patients. In general, health workers provided antimalarial medications in tablet form; and, in many countries, treatment (at least the first day) was provided on the spot.⁴ Lower levels in Senegal for community-based workers could reflect stock-outs at village levels and reluctance to prescribe when there are few other accessible sources of chloroquine. However, it is possible that some fever cases were treated for other diagnoses. In Africa, where data were available on the form of antimalarial given, use of injectable quinine was relatively rare in Senegal, but more frequent use of injectable chloroquine was found in

Table 2-2
Observations of Health Workers: Clinical Assessment for Malaria
 (percentage of patient-health worker encounters where task was performed)

country	Niger*	Senegal*	Senegal*	Zaire	Punjab	Punjab	Regi
type of worker	CHW	CHW	Clinic	Clinic	CHW	Clinic	Clinic
nb. observations	81	105	25	57	150	194	24
Asking History of Illness							
-- Degree of Fever	51	47	72	-	-	-	-
-- Duration of Fever	-	79	100	-	31	96	50
-- Fever Pattern	16	37	64	-	10	59	21
-- Chills/Sweats	2	-	-	16	21	52	54
-- Headache	14	-	-	2	-	25	-
-- Vomiting	10	-	-	79	-	37	-
-- Convulsions	1	-	-	18	-	4	-
-- Treatment at Home	4	11	33	40	-	5	-
Physical Exam and Lab							
-- Assess Temperature#	31	59	92	90	0	53	46
-- Take Blood Slide@	NA	NA	NA	NA	87	31	50

- data not available

* Some treatments were simulation/role-plays: Niger (12%); Senegal (CHW 37%, Nurses 12%);

Assessment includes tactile or with thermometer

@ This includes reading of slides taken in the field

Table 2-3
Observations of Health Workers Carrying Out Malaria Treatment
 (percentage of patient-health worker encounters where task was performed)

country type of worker nb. observations	Niger*	Senegal*	Senegal*	Zaire	Punjab	Punjab	Regi
	CHW	CHW	Clinic	Clinic	CHW	Clinic	Clinic
	81	105	25	57	150	194	24
Any Antimalarial Treatment***	99	47	68	91	48	> 60	96
Adminster Treatment@							
- Chloroquine Tablets	92^	31++	60++	65	48#	-	96#
- Chloroquine Injection	NA	2	8	25	-	-	-
- Aspirin	21	41	72	81	-	-	-
Prescribe Treatment+							
- Chloroquine Tablets	7	26	12	18	-	-	-
- Chloroquine Injection	NA	1	8	0	-	-	-
- Aspirin	13	29	8	2	-	-	-
Correct Dosage	51^^	36**	57**	41##	-	60#	-

- data not available

* Some treatments were simulation/role-plays: Niger (12%); Senegal (CHW 37%, Nurses 12%);

*** This includes any form, either administered or prescribed

@ This includes those given at the time of the encounter or dispensed from the clinic pharmacy

+ This includes recommended or prescribed treatments

^ In Niger, the systems analysis team provided chloroquine to CHWs when their drug kits were empty.

++ Some may be prescriptions, as certain treatments were recorded as

"administered" when no drugs were available

Data do not indicate what kind of anti-malarial drug was given

^^ Although 22% of doses were considered excessive, none were dangerous

** This percentage is for treatments of children under 5 only (88% of all treatments)

This percentage goes to 81% if single dose treatments are considered correct (10 mg/kg)

Zaire. It is not known whether this pattern is due to a different case load, or to differences in treatment practices and policies.

Dosages for treatment were assessed in Niger, Senegal, Zaire, and Punjab (clinic workers). Correct dosage by village level health workers was not much different from clinic-based workers. However, a common problem, as exemplified in Senegal and Zaire, was the variation in treatment protocols followed. In Senegal, health workers generally applied one of two different protocols, but only one is officially endorsed by the Ministry of Health (MOH). In Zaire, single dose treatments and multiple dose treatments were used, although the MOH endorses the multiple dose (25 mg/kg body weight over 3 days).

2.4 COUNSELING OF MOTHERS AND HEALTH EDUCATION

Although the role of the patient/mother in malaria treatment is smaller than with diarrhea case management and growth monitoring/nutrition, it is important for health workers to assure that patients/mothers understand how to take the drugs (quantity and duration), the importance of completing the treatment (radical cure, not suppression of symptoms), and that they should return if the fever persists or the child does not get better. Health workers can also provide information about prevention of malaria, such as destroying breeding sites and sleeping under mosquito netting.

2.4.1 INDIVIDUAL COUNSELING DURING TREATMENT

Table 2-4 presents data on counseling messages given by health workers during the treatment of fever patients. With the exception of clinic-based workers in Senegal, health workers provided information on how to take the anti malarial drugs only about half the time.

Completion of drug therapy is important for radical treatment and for discouraging resistance. However, only MPHWs in Punjab stressed this more than a quarter of the time. MPHWs stressed this with almost 100% of those provided presumptive treatment. In their case, they were not allowed to provide complete treatment, and the fever cases would have to go to the BHU to have the results of their blood slide read and receive the rest of the treatment. However, in all other countries, this information was imparted for only 5-28% of the cases observed. It is possible that some cases involved treatment via injections or treatment administered only at the clinic. However, this would still require encouraging patients/mothers to return for follow-on treatment.

Another important message for mothers/patients is an explanation of the circumstances under which they should return for followup consultation. Given the difficulty of precise diagnosis of malaria and the increasing drug resistance in many developing country circumstances, it is important for patients to be aware that, if their condition worsens or if their fever persists after 2 days of treatment, they should return. This message should be given for all malaria cases. However, in Niger, Senegal, and Punjab, where data on this were collected, health workers provided this information to less than half their patients (range = 5-52%). In Zaire, data were collected only on whether health workers gave patients a date when to return. Eighty-nine percent of fever patients were told a date, 95% of whom were told to return later that day or the next day to finish their treatment.

Although information on counseling technique was only collected in Pakistan, both Punjab and Regi clinic-based workers asked less than 15% of patients/mothers to repeat instructions to verify

Table 2-4
Observations of Health Workers Counseling Mothers
 (percentage of patient-health worker encounters where task was performed)

country type of worker nb. observations	Niger*	Senegal*	Senegal*	Zaire	Punjab	Punjab	Regi
	CHW	CHW	Clinic	Clinic	CHW	Clinic	Clinic
	81	105	25	57	150	194	24
Counseling Messages							
-- How to take drugs	-	49*	76*	11*	-	52*	48*
-- Need to Finish TTT +	5	5	28	-	53	21	25
-- Need for Blood Slide	NA	NA	NA	NA	-	6	29
-- Circumstances under which to return	31	14	52	-	-	5	-
Counseling Methods							
-- Have mother repeat	-	-	-	-	-	13	9
-- Invite questions	-	-	-	-	-	13	9

- data not available

* these are taken as a percentage of cases where tablets were given

+ this includes explaining the consequences of not finishing the treatment

TTT = treatment

if they had understood correctly, and from less than 10% of the patients/mothers did health workers invite questions.

2.4.2 GROUP HEALTH EDUCATION

Observations were made of group health education sessions in both Zaire and Niger. In Niger, the systems analysis team asked community-based workers to conduct a session while they were present. Of the 163 health education sessions observed, 46 (28%) covered malaria, and the average duration was only 4.3 minutes. Sixty-seven percent of these sessions had 10 or more participants. Topics covered most frequently included: destruction of breeding sites (48%), drugs to be used to treat fever at home (41%), signs of malaria (39%), sources of anti-malaria drugs (35%), and consequences of not treating malaria (22%). The average number of malaria topics covered was 2.4, although 46% of sessions covered only 1 topic.

In Zaire, health education sessions were held as part of well-child clinics which offer immunizations and growth monitoring. Of the 25 sessions observed in Zaire, only 4 covered topics related to malaria. Malaria topics dealt mainly with treatment. The average attendance was over 90 mothers (range= 53-150). All sessions relied on lecture and song to impart information to mothers. Observers felt that in all four sessions where malaria topics were discussed, health workers had made effective contact with the audience and had used appropriate language. However, the methods used required only passive participation of the mothers.

Although their performance was not observed, community-based workers exist in many villages in Zaire. Of the 55 community-based workers interviewed throughout the 4 health zones, 60% responded that they conducted health education on malaria topics, and 49% said they carried out environmental activities to control mosquitos. Only 20% responded that they provided treatment, and only 6% said they distribute antimalarial drugs. Generally, it is the policy in Zaire that CHWs do not distribute drugs or treat patients.

2.5 MOTHERS' KNOWLEDGE AND PRACTICE

Three systems analyses included exit interviews with patients/mothers in order to assess knowledge after consultation with health workers. Four of the five systems analyses included household interviews to assess utilization and knowledge about malaria, its treatment, and its prevention.

2.5.1 MOTHERS' KNOWLEDGE DURING EXIT INTERVIEWS

The top half of Table 2-5 presents data from exit interviews with patients in Niger, Regi, and Punjab.⁵ In Punjab and Niger, a high percentage of patients/mothers could correctly repeat the dosage prescribed by the health worker. Figure 2.1 shows how, for specific counseling messages, the percentage of mothers/patients having adequate knowledge is often superior to the percentage that received counseling during the observed consultation. This is true for: the need for blood slides (Punjab), the need to complete treatment (Niger and Punjab), and circumstances under which to return for followup (Niger and Punjab). In these instances, the percentage of mothers/patients knowing was at least twice as high as those receiving counseling, and often more than four times as high. Only in Regi did the percentage of patients/mothers responding correctly reflect the level of those receiving counseling.

Table 2-5
Mothers Knowledge and Use of Malaria Treatment
 (percent of mothers interviewed)

EXIT INTERVIEWS				
country	Niger	Regi	Punjab	Zaire
nb. observations	81	23 [^]	149	-
- knows dosage prescribed	86	-	65	-
- knows > = 1 danger signs	60	-	-	-
- knows need blood slide	-	22	44	-
- knows need for complete TTT	63	30	84	-
- knows when to return	75	26	100	-
HOUSEHOLD SURVEY				
country	Niger	Regi	Punjab	Zaire
nb. observations	378	487	1313	677
(general knowledge)				
- > = 1 signs/symptoms of malaria	80	-	49	88
- knows to take complete TTT	-	-	43	-
- knows correct dosage chloroq.	43+	-	-	-
- knows ways to prevent malaria	-	-	34	54
- knows > = 1 danger sign	77#	-	-	81#
- took malaria prophylaxis last preg	27	-	-	57
(for recent malaria cases)	(N=233)	(N=52)	(N=307)	(N=347)
- visited health worker	56@	90*	79*	62
- gave chloroquine	53	-	-	36

- data not available

[^] these percentages include only unprompted responses

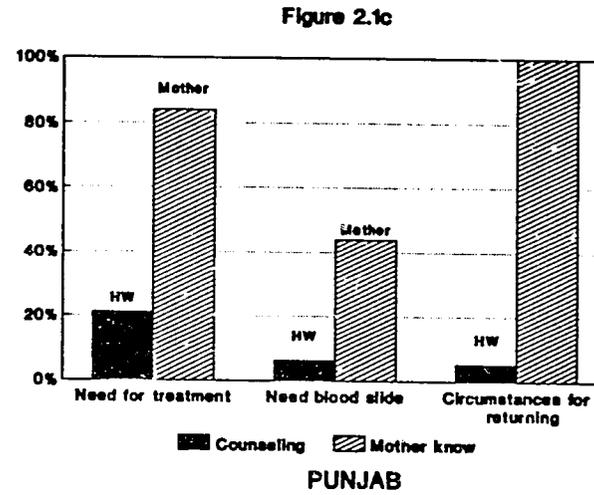
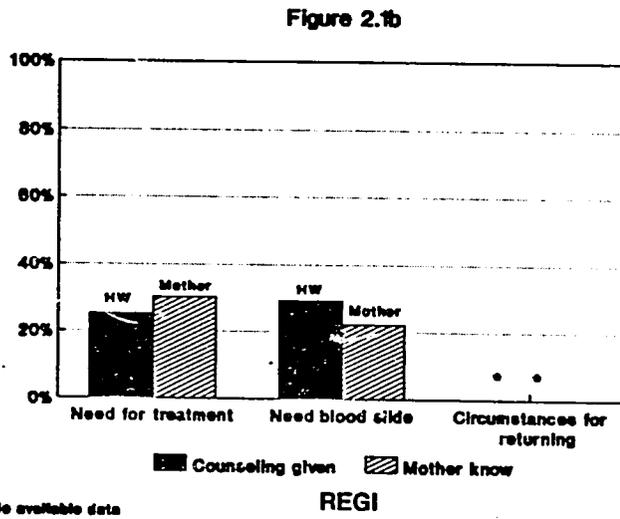
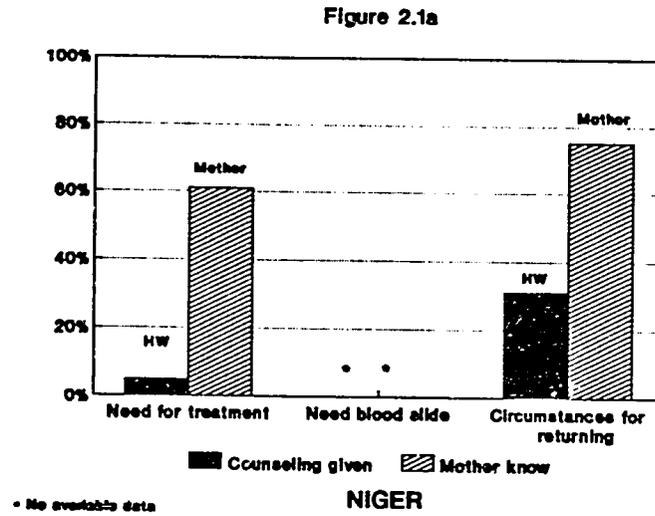
+ 21% of dosages cited by mothers were in excess

If this is taken for > = 2 signs, the percentages change to 8% for Niger and 64% for Zaire

* For those going to the BHU, the percentage drops to 2% in Regi and to 23% in the Punjab

@ 10% of mothers took their child to the health post nurse

Figure 2-1



more than four times as high. Only in Regi did the percentage of patients/mothers responding correctly reflect the level of those receiving counseling.

These results imply that mothers/patients have other sources of information besides individual counseling during current treatment. It is not known if this is from previous treatments, group health education sessions, mass media, or other sources.

2.5.2 MOTHERS' KNOWLEDGE AND PRACTICE FROM HOUSEHOLD SURVEYS

Four systems analyses included household surveys: Niger, Regi, Punjab, and Zaire. In Africa, where malaria is hyperendemic in many areas, these results show good knowledge levels about malaria, both for signs/symptoms of malaria and danger signs. In contrast, in Pakistan, where malaria has an unstable pattern and is less common, less than 50% of households could identify at least one sign of malaria. In Niger, the percentage of mothers with children under 5 who could cite the correct chloroquine dosage for malaria treatment was not much different from that for community-based workers: 43% as compared to 50%. Information on knowledge about prevention was collected in Zaire and Punjab. In neither case was it high, not even in Zaire where malaria is holoendemic. Moreover, household surveys in Niger and Zaire revealed utilization rates for malaria chemoprophylaxis during pregnancy to be low, 27% and 57% respectively, and in Niger, only half of those women having taken chemoprophylaxis received adequate doses.

Utilization of health services for malaria was assessed in four systems analyses: Niger, Zaire, Regi, and Punjab. Treatment and source of care were asked for recent malaria/fever cases. A majority of mothers reported visiting a health worker for these episodes. However, in Pakistan, the percentage of cases that were seen at the government clinics (where health worker performance was observed) was substantially lower: in Punjab, 23% and in Regi, 2%. The rest were seen at private clinics or at the hospital. In Zaire, examination of health center records indicates that utilization rates from the household survey are overestimations. Using an incidence rate extrapolated from the household survey of 2.1 fever cases per year, clinic data indicate a treatment rate of about 25%. It is likely that mothers exaggerate their utilization rates when being surveyed.

In Niger, of the 53% of mothers who gave chloroquine during their child's last malaria/fever episode, 81% reported obtaining their chloroquine from the community-based worker. In a later study using focus groups to discuss the possibility of increasing community support for these workers, mothers recognized the important role these workers play in the treatment and supply of chloroquine.

2.6 CONCLUSIONS ABOUT MALARIA SERVICE DELIVERY

Observed performance for clinical assessment by community-based workers was generally poor: VHWs in Niger asked no questions in 35% of cases and did no physical exam in 65%. In the Punjab, for the 150 fever cases detected, 63% were asked no questions beyond the presence or absence of fever. Even clinic-based workers were not generally thorough in their history and physical exam. Identifying the origin of the fever is important to assure correct treatment. Even in areas where all fevers in children under 5 and pregnant women are to be treated with chloroquine, it is crucial to assess and treat other possible causes as well.⁶ Inadequate assessment could lead to both overtreatment for malaria or lack of treatment for other ailments. It would appear that health workers often abide by the patient's assessment of fever and accept malaria as the

diagnosis, without really exploring the possibility of other causes. The lack of laboratory confirmation in Pakistan exemplifies this approach to malaria diagnosis.

Although malaria treatments have been part of the health system's activities in these countries for a very long time, problems continue in providing correct dosages. Protocols have changed over time, but it seems that these changes are not being transmitted to workers in the periphery, where many different treatment protocols were observed.

Finally, counseling of patients/mothers is weak. Health workers are not making sufficient effort to provide the key messages about the importance of completing treatments and the danger signs that indicate the need for followup. Malaria, with the increasingly widespread resistance to chloroquine, is becoming more difficult to treat. It therefore becomes more important that radical cures are carried out fully and that persistent fevers receive laboratory confirmation and/or alternative drug therapy.

¹ In Niger, VHWs may have had prior knowledge that the cases they were treating were "malaria." However, they had been taught to refer if vomiting, stiff neck, convulsions, coma, runny eyes or nose, ear drainage, or skin eruptions were present; and, therefore, they should have looked for these signs, even if they knew the case was "malaria."

² Data from clinic workers for blood slides include those who had slides taken in the field.

³ WHO, "Practical Chemotherapy of Malaria," WHO Technical Report Series, No. 805. Geneva: WHO (1990).

⁴ In Niger, the administration rates in this table may not reflect reality. When VHW drug kits did not contain any chloroquine and the VHW was prescribing it to the patient, the systems analysis team occasionally provided the VHWs with chloroquine. This was done to be able to assess whether VHWs knew the correct dosages. Of the 84 male VHW drug kits inspected at the time of the systems analysis, 52% contained no chloroquine.

⁵ Exit interviews were performed only for clinic-based encounters.

⁶ Data from health centers in one Arrondissement in Niger where blood samples were taken from patients treated presumptively for malaria showed that only 56% of blood samples taken in the rainy season and 12% of those taken in the dry season were found positive. [Data obtained in "Niger: Assessment of Malaria Control," report prepared by Alfred Buck and Norman Gatz for the Vector Biology and Control Project, 1990.] Similar data from Burkina Faso showed that only 46% of patients diagnosed with malaria had parasitaemia. [Baudon, D. et al, "A Study of malaria morbidity in a rural area of Burkina Faso," Transactions of the Royal Society of Tropical Medicine and Hygiene, V. 79, pp. 283-284, (1985); cited in "Practical Chemotherapy of Malaria," WHO Technical Report Series, No. 805 (1990).]

3. ASSESSMENT OF SUPPORT SERVICES RELATED TO MALARIA TREATMENT

3.1 INTRODUCTION

This chapter discusses support activities for malaria treatment and factors that might explain the problems in service delivery performance. This chapter will focus on logistics, supervision, and training, the three support system activities that have the most direct effect of health worker performance. Logistics, supervision, and training ensure that workers have the necessary resources and skills to carry out their assigned tasks.

The structure of these support systems differed among the four countries and presented more diversity than did the clinical settings and service delivery tasks of health workers. In addition, because support activities do not usually take place as frequently as service delivery, systems analysis teams had more difficulty "observing under typical conditions." Supervision encounters were only observed systematically in three countries, and not even for all levels of workers. No systems analysis team was able to observe training activities because of the absence of on going training programs at the time the systems analyses were carried out.

3.2 LOGISTICS AND SUPPLIES

Part of understanding health workers' behavior in malaria case management involves knowing whether they had the necessary resources to work with. Although no systems analysis attempted to analyze the full system for producing, distributing, and storing chloroquine, most examined availability and reliability of supplies of chloroquine at the peripheral level.

TABLE 3-1

PERCENTAGE OF HEALTH WORKERS WITH CHLOROQUINE IN STOCK AT VILLAGE AND HEALTH CENTER LEVEL AT THE TIME OF THE SYSTEMS ANALYSES

Niger(CHW)	Senegal(CHW)	Senegal(Clinic)	Zaire(Clinic)
48%	57%	80%	78%
(No quantitative information on antimalarial supplies was available from systems analyses in Regi or Punjab).			

Logistics data from the three African countries indicated the presence of some supply problems. Availability of chloroquine tended to be more problematic for community-based workers. In Senegal, only 57% of health huts had chloroquine in stock, and only 63% had aspirin. Of those CHWs having chloroquine in stock, 31% did not feel their stock was sufficient.

In Niger, only 48% of male VHWs had chloroquine in their kits on the day they were interviewed, and only 13% had more than 1/4 of a box (box=1,000 tablets). Many had experienced stock shortages, with 89% saying they often ran out of chloroquine and 66% saying that supply was a problem. Following the systems analysis, prices for chloroquine in Niger were reduced nationwide. Although the data are not conclusive, later surveys indicate that availability may have improved at village level.

Chloroquine stocks at health service facilities visited were less problematic in Senegal and Zaire, where more than 80% of centers visited had chloroquine in stock. However, 34% of clinic-based workers in Senegal cited problems with chloroquine stocks. It should be noted that for the levels of workers assessed in the systems analyses of these three countries, fees are charged for services which are used to help replenish drug stocks.¹

In interviews, health workers and supervisors at Regi indicated persistent shortages of insecticides, antimalarials, microscopes, and lab equipment.

These specific health centers and village-based units may not represent the situation throughout these countries, but they do indicate some continuing problems in supplies.

3.3 SUPERVISION

If malaria treatment services are to be effective, supervisors must give serious attention to improving health worker performance in malaria case management and health education. Quality supervisory performance will include such components as: 1) giving explicit priority to identifying and resolving problems in technical as well as administrative performance; 2) observing health workers actually delivering malaria services; 3) making use of supervisory checklists or other job aids to guide service delivery observation and the monitoring of support services; 4) maintaining supervisory schedules and records; 5) providing health workers with timely feedback; 6) problem-solving; 7) taking appropriate follow up action; and 8) supporting and encouraging health workers.

All five systems analyses gathered some data about supervision. Some systems analyses included direct observations of supervisor-health worker encounters. Others interviewed both supervisors and health workers.

3.3.1 OBSERVATION OF SUPERVISORY ENCOUNTERS

Systems analyses in Niger, Pakistan, and Senegal carried out extensive observations of supervisory visits² to assess what supervisors do during their visits and to assess their skills in detecting problems in service delivery and providing technical support. However, the circumstances under which these observations took place and the way the data were coded varied greatly. In Niger, observers went out with supervisors and told them to do what they normally did. Observation of supervision (N=51) was done separately from service delivery observations of VHWs, and during none of the observed supervisory sessions did a malaria case present itself to the VHW. In the Punjab, supervisors accompanied multipurpose health workers on their home visits (N=152) where workers were to detect fever cases, take blood samples, and provide presumptive treatment, as well as detect diarrhea cases and provide immunizations for those who needed them. Another set of supervisors were observed holding meetings with the worker (N=36). In Senegal, supervisors were accompanied on their regularly scheduled supervision visits and were observed at the same time that observations were being made of health worker

observed in the presence of a supervisor.

In Niger, 51 observations were carried out on supervisory visits made by 27 dispensary nurses. Although supervisors observed drug kits and VHW notebooks in 100% of visits, supervisors discussed aspects of malaria treatment activities during only 28% of these visits. When supervisors did discuss malaria, they focused almost exclusively on treatment (11/13). However, the systems analysis showed that many other aspects of worker performance were also weak: for example, only 68% of the 81 observed malaria treatments had included any history questions, and only 35% had any physical exam; less than 10% involved any counseling beyond returning if not better. The absence of opportunity to observe case management made it difficult for supervisors to identify these weak areas.

In Pakistan, supervisors were observed while they accompanied multipurpose health workers on 152 home visits and while they held 36 individual meetings with supervisees. Although 74% of the observed supervised home visits included some discussion or demonstration by supervisors, only 39% of these supervised home visits involved any discussion focused on malaria. And in 65% of observed home visits, health workers did not screen for fever cases. Of the 152 observed supervisory visits, 53 included detection of a fever case. For these cases, supervisors discussed or demonstrated taking of a blood sample 70% of the time, history-taking 38% of the time, and giving presumptive treatment 55% of the time. This implies that once a fever case is detected, supervisors take an active role. However, worker performance in detection appears weak. During meetings held between supervisor and MPHWS (N=36), only 4 times did supervisors discuss follow up of fever cases. However, supervisors did demonstrate taking blood samples 50% of the time. Taking a history was discussed in 40% of these meetings and administering presumptive treatment in 22%. Thus, it appears that although malaria is not always raised as an issue, when it is, supervisors do stress blood samples, the major malaria task of these MPHWS.

In Senegal, supervisors were accompanied on their regularly scheduled visits. During these observed supervision encounters, health post nurses supervising community-based workers discussed history, physical exam (taking temperature), and treatment more often than did regional and departmental supervisors supervising health post nurses. The pattern, seen in Table 3-2, reflects the levels of worker performance as well, with the exception of counseling. Supervisors at all levels discussed counseling of patients about equally, even though community-based workers performed more poorly than clinic-based workers. However, neither level of worker performed counseling adequately. Thirty-two percent of departmental/regional supervisor-health post nurse encounters in the presence of a malaria case involved no discussion of any item. Supervision of CHWs was more thorough, with 79% discussing at least one item, and 45% discussing three or more items. Departmental supervisors expressed their feelings of awkwardness in offering technical feedback to health post nurses who have about the same level of technical training. Yet, in post-supervisory interviews, only 3 supervisors identified incorrect malaria treatment dosages as a service delivery problem, even though less than half of the treatment dosages were correct.

TABLE 3-2

PERCENTAGE OF SUPERVISORY ENCOUNTERS WHERE SUPERVISOR DISCUSSED ASPECTS OF MALARIA TREATMENT IN SENEGAL

SUPERVISEE	HISTORY	PHYSICAL EXAM*	TREATMENT	COUNSELING
Community-based Worker (N=55)	57%	38%	69%	43%
Health Post Nurse (N=23)	32%	16%	24%	44%
* Discussions of physical exam are limited to discussion of evaluating temperature.				

3.3.2 SUPERVISOR'S KNOWLEDGE OF PROBLEMS IN HEALTH WORKER PERFORMANCE.

In order to correct performance problems, supervisors must first be aware of their existence. In Senegal, supervisors were interviewed after their observed supervision visit about how well they thought health workers were performing. These data, compared to observed health worker performance, provide information on how well supervisors recognize problems in the quality of health worker performance. These data indicated that supervisors consistently overestimate the performance of their health workers.

Figures 3.1a and 3.1b show that both supervisors of clinic-based workers and supervisors of community-based workers generally estimated worker performance to be "acceptable" ³ the first bar represents supervisory impressions and the second bar represents worker performance. Supervisory impressions of acceptable performance fluctuate between 82% and 96%, with supervisors of both levels of workers overestimating performance for almost every task. For clinic-based workers, the percentage of health workers performing at acceptable levels was 35-44% percentage points lower. For community-based workers, the differences were even greater, ranging from 30% to 69%. The smaller difference for clinic-based workers is in part because of their higher level of performance, leaving less margin for overestimation.

These graphs reveal that Senegalese supervisors do not always have a realistic picture of what health workers are actually doing or what problems they are experiencing, even when they do visit their health workers. Although some supervisors used checklists, these focused on finances, record-keeping, and cleanliness of health post/hut. Even when they did contain some items on technical performance, these were very general. When asked to mention two problems they identified during their visits, only 13% of problems cited were malaria-specific or could be related to management of curative cases. This implies that health worker performance problems are not being resolved, since supervisors are not aware of them.

Figure 3.1a Senegal
Supervisory Impressions of Acceptable
Clinic-Based Worker Performance Compared
to Observed Performance

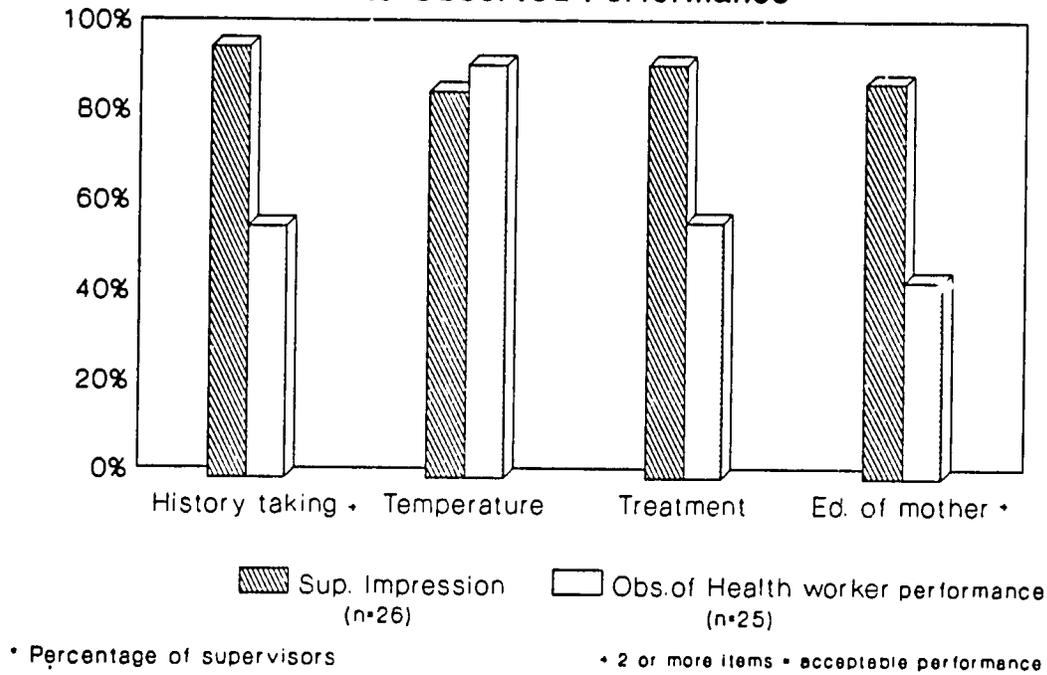
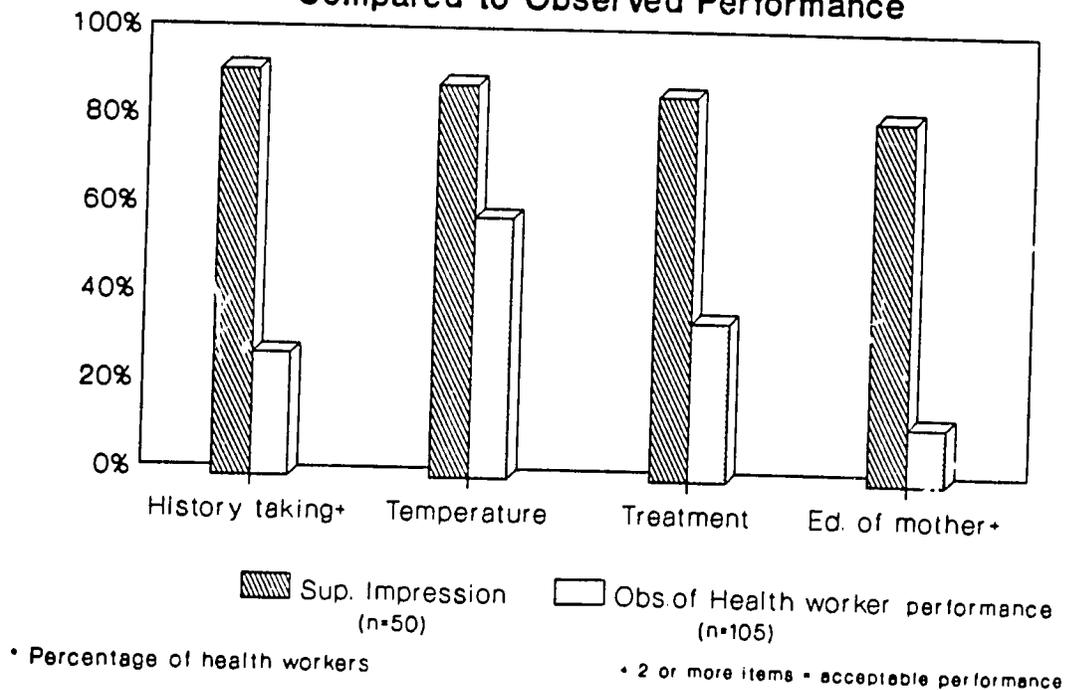


Figure 3.1b Senegal
Supervisory Impressions of Acceptable
Community-Based Worker Performance
Compared to Observed Performance



Data from systems analyses in other countries and for other interventions showed similar gaps between supervisors' impressions of worker performance and actual performance.⁴

3.3.3 WHAT HEALTH WORKERS SAY SUPERVISORS DO DURING SUPERVISION

Since supervisors were aware that they were being observed, it is possible that these observations do not represent what supervisors normally do during their visits. Thus, observations were supplemented with interviews of both supervisors and supervisee in Niger, Senegal, and Regi. Community-based workers in Niger and Senegal stated that supervisors focused mainly on administrative control activities, such as checking drug stocks, records, and finances. In Niger, none of the village health workers interviewed said their supervisors asked them about problems or tested their knowledge; 66% of the supervisors themselves declared they never observed VHW consultations, and 81% said they never observed health education sessions. However, in Senegal, 61% of CHWs interviewed recalled their supervisor discussing malaria with them, and 62% recalled a supervisor demonstrating something about malaria activities.

Clinic-based workers also stated that supervisory activities were oriented on administrative issues. In interviews in Regi, health workers reported that supervision focused on checking drug stocks, records, and attendance. Of the 18 health worker-supervisor pairs, 68% seldom or never included observation of service delivery.⁵ In Senegal, only 29% of clinic-based workers interviewed remembered their supervisor having at least once observed them treating a malaria case, only 34% said their supervisors had discussed malaria with them, and only 20% remembered supervisors ever demonstrating correct malaria performance.

These interviews provide a slightly different picture of supervisory encounters, with supervisors generally not focusing on the technical aspects of workers' responsibilities. Several supervisors in training in the Punjab (Pakistan) stated they had not thought about using systematic observation of how services were being carried out to improve supervision and worker performance.

3.3.4 FREQUENCY AND DURATION OF SUPERVISION ENCOUNTERS

Another important aspect of supervision is the frequency and duration of encounters. In almost all cases of observed supervisory encounters, supervisors were provided with transportation by the systems analysis team. Thus, health workers were interviewed in Niger, Senegal, Zaire, and Regi to assess whether first-level supervisors were regularly visiting their health workers. Interviews with clinic-based health workers revealed that they were meeting with their supervisors: in Zaire, Senegal, and Regi (Pakistan), nearly all health workers reported being visited by a supervisor at least once in the previous 3 months.

For community-based workers, supervision was generally less frequent. In Zaire, only 21% of the 57 interviewed village level workers (mama bongisas⁶ and sanitarians) said they had been supervised in their village in the last 3 months. Of those having been supervised (N=12), only two said they had been supervised by a nurse. The other 10 cited supervision by the village health committee. Eight VHWs stated that they met monthly with the nurse at the health center. In Niger, village health workers received visits from their supervisors on an average of only 1.2 times in 1988. In Senegal, 67% of community health workers interviewed had been visited with the last 3 months (60% had been visited at least monthly).

It is not known from this interview data how frequently malaria activities were reviewed during these supervision encounters for any of these countries.

In Senegal, Regi, and Zaire, information was also collected from interviews on the duration of past supervisory visits. For CHW in Senegal and clinic workers in Regi, the median duration was 30 minutes. In Zaire, 3 hours was the average duration of supervisory visits. Clinic-based workers in Senegal received supervision visits lasting a median of 2 hours.

3.3.5 GENERAL CONCLUSIONS ABOUT SUPERVISION

Interviews with health workers and supervisors showed that, although supervisors are meeting with health workers, they rarely observe health workers carrying out malaria case management or health education. When asked how well they think health workers are performing certain tasks, supervisors in Senegal tended to overestimate performance, even after observing. When supervisors were asked to observe worker performance, it appears that they generally do not discuss or provide much feedback and tend to focus on malaria treatment, ignoring health worker performance deficiencies in clinical assessment and counseling. Thus, supervision, as currently carried out, is not identifying and addressing all the quality of care issues in malaria case management. Even with the focus on treatment, this does not appear to have had an effect on worker performance in this area: incorrect dosages were observed fairly frequently.

3.4 TRAINING

The previous section on supervision has indicated that the supervision process, as currently performed, is not identifying or solving problems in health worker performance. Yet, even though weaknesses were found in clinical assessment, treatment dosages, and counseling, some health workers are correctly performing these tasks. In the absence of much active technical supervision and support, performance of these workers must be primarily due to training which can furnish health workers with the knowledge and practical skills to carry out their assigned malaria tasks.

None of the systems analyses was able to observe formal training sessions. Information on training was collected retrospectively through health worker interviews. As seen in Table 3-3, many of the workers interviewed in these countries said they had received training in malaria treatment within the last 3 years.

TABLE 3-3

PERCENTAGE OF HEALTH WORKERS INTERVIEWED WHO HAD RECEIVED TRAINING ON
MALARIA IN THE LAST THREE YEARS

Niger	Senegal(CHW)	Zaire(CHW)	Zaire (Clinic)	Regi
65%	25%	38%	70%	75%

In Niger, according to local policy all male village health workers are to receive training in the management of malaria as part of their original training course. All of the male village health workers surveyed had indeed been trained to treat malaria. However, only 65% had attended a refresher course in 1986-1988. Refresher courses are basically repeat sessions of the original course with updates on changes in therapy or protocols. Review of the training manual showed that VHWs are to be instructed in identifying signs/symptoms for referral (convulsions, vomiting, neck stiffness, coma, runny eyes and nose, ear drainage, skin eruptions). Of those having had a refresher course, they attended it, on the average, 3 years before.

In Senegal, no information was available on recent training of health post nurses, but only 25% of CHWs had received training on malaria within the last 3 years. Half of CHW training sessions covering malaria treatment also covered other subjects.

In Zaire, of the 70% of clinic workers receiving training on malaria activities in the previous three years, almost 95% [31/33] said training covered treatment for malaria, and 85% had received training for chemoprophylaxis for malaria. Seventy-two percent said they had been evaluated, but only one quarter said they had been evaluated through observation for malaria treatment. However, only 38% of community-based workers had been trained or received refresher training in the last 3 years.

In Regi, three out of four health workers interviewed had been trained during the last three years for malaria. Lectures and practice were generally given equal time, but no trainee reported having been tested after training.

Clinic-based workers in these countries generally received recent training on treatment of malaria. However, community-based workers, who would require more technical support had been trained less frequently. Given the changes in malaria therapy protocols, the lack of refresher training could easily lead to problems in treatment.

3.5 CONCLUSIONS

Information on logistics, supervision, and training revealed certain weaknesses in these support systems. Although most countries have been able to provide a certain "quantity" (chloroquine, supervision visits, training sessions), the content and methods generally are not addressing the performance problems seen in Chapter 2. Due to the cross-sectional nature of the data collection, these systems analyses do not permit making direct links between worker performance and support activities. However, they do point to areas where efforts could likely produce important improvements in worker performance. Without technical supervision or training, worker performance can be expected to be weak.

Supervision does not focus on the technical aspect of malaria case management and rarely includes observation of health worker performance. Supervisors' overestimation of performance in Senegal and similar results from other countries for other interventions suggests that, without structured observation, they will be unable to identify problem areas and take action to improve performance. Yet, even when they were observing, supervisors tended to focus on the "treatment" aspect, leaving clinical assessment and counseling aside. Supervisors also need observation skills to help them focus their attention on specific technical aspects. Supervisors need to know what to look at and what to look for to be able to assess worker performance in technical areas. Finally, creative solutions must be found to provide supervisors with opportunities to observe worker performance in community-based programs, where case loads are light.

Weaknesses in current supervision, logistics, and training efforts are reflected in the weaknesses seen in the clinical assessment, treatment dosages, and counseling aspects of malaria treatment.

- ¹ In Niger, treatments at dispensaries and health centers are free of charge.
- ² In Zaire, a total of five supervision visits were observed, at least one in each zone, to assess the standard supervisory tour. Three of these included supervision of malaria. Of these, only one supervisor observed a patient-health worker encounter, while two others inspected the health center treatment register to verify treatment schedules.
- ³ "Acceptable" for history-taking and education of the mother refers to two or more items being carried out.
- ⁴ See the Service Quality Assessment Series for Oral Rehydration Therapy and the Philippines Systems Analysis Report.
- ⁵ The supervision system included many different supervisors for the same worker, depending on the technical field. Out of 7 health workers and 10 supervisors, there were 18 pairs.
- ⁶ Mama bongisas are village women trained to give advice and health education to mothers in the village.

4. CONCLUSIONS: STRENGTHS AND WEAKNESSES IN MALARIA SERVICE DELIVERY AND SUPPORT

4.1 CONCLUSIONS

Malaria continues to be one of the major killers of children in Africa and contributes to morbidity throughout much of the world. Chloroquine has provided a safe, inexpensive, and effective treatment for malaria. However, increasing parasite resistance to chloroquine is becoming widespread, requiring more careful use of drug therapy. PRICOR's five systems analyses of malaria treatment in four countries have examined the quality of malaria case management and health education. These systems analyses have found both strengths and weaknesses in each country studied, and have identified a number of commonalities among the four countries in system performance.

The following strengths were found fairly consistently across all programs assessed:

- Most health centers had chloroquine in stock.
- Supervisors were visiting health workers (except in Niger).
- Most clinic-based health workers had received training in malaria within the past 3 years.
- Most community-based and clinic-based health workers were prescribing chloroquine for the fever cases they encountered, and many explained to patients/mothers how to take the drugs.
- Many mothers knew about malaria, its danger signs, and the need to complete treatment.

These strengths reflect efforts made by Ministries of Health and international organizations to bring malaria treatment to the people by incorporating malaria activities into the PHC systems.

However, some important problems were also revealed in these five systems analyses:

- Health workers' clinical assessments were generally cursory, especially among community-based workers. As a result, case management based on assessment of fever origin was uncommon.
- Clinic-based workers in Pakistan did not routinely request blood slides before treating presumptively, as called for by the local treatment protocols.
- Treatment dosages were not standardized, and were often wrong.
- Health workers were not communicating to mothers the need to finish the malaria treatment and the danger signs indicating the need to return for followup.
- The supervision system was not addressing the above deficiencies.
- Community-based workers were not receiving refresher courses.

- Community-based workers were experiencing problems in maintaining chloroquine stocks at village level.

Clinical assessment in most countries tended to be weak, with workers not systematically examining patients for other possible causes of the fever. Even where all fevers are to be treated presumptively as malaria, other causes should be sought. Incomplete clinical assessment means that patients may not be getting the appropriate treatment: for cases of meningitis and pneumonia, this could be fatal. Data from Niger and Burkina Faso have shown that only 10-52% of cases treated as malaria had parasitaemia.¹ In areas with chloroquine resistance, more careful diagnoses can prevent unnecessarily prescribing more toxic antimalarial drugs.

Health workers were observed applying a range of treatment regimens for malaria. This indicates a lack of clarity or inconsistent updating of treatment protocols. In areas with increasing chloroquine resistance, low dosage treatments may not lead to cure and may increase resistance further. Protocols have changed often in recent years, as resistance spreads.

Health workers are also not communicating important messages to the mothers. This finding runs parallel to those of service quality assessments for other interventions that show health worker counseling weak across the board. In malaria treatment, this may actually be less important than for other interventions, but since health workers are not performing adequate clinical assessments or laboratory tests, they may be missing other ailments or cases of resistance. If health workers do not provide mothers with information on what they should look out for, such as signs of chloroquine resistance, mothers may think that health workers are ineffective and lose confidence in the health workers' abilities.

The supervision systems have little or no focus on technical quality. The accent on administrative issues means that supervisors are not identifying problems in worker performance, and therefore are not addressing weaknesses in clinical assessment, treatment, and counseling.

Training and logistical support of community-based workers was generally problematic in these countries. These weak systems jeopardize the potential effect that these peripheral workers can have on malaria. In areas of endemic malaria, these workers are often the only readily accessible sources of treatment and education.

4.2. USE OF RESULTS IN FIVE COUNTRIES AS THE BASIS FOR OPERATIONS RESEARCH

One of the major outcomes of the individual country studies presented in this comparative review has been the use of results by local and national managers. PRICOR worked with these managers to help address some of these problems through operations research. Many managers in these countries had not known specifically where their systems were weak. Routine monitoring data normally provided them only with information on number of chloroquine tablets distributed and number of malaria/fever cases treated. When systems analysis results about the process of care were presented to managers in workshops and seminars, this information was welcomed: knowing where the problems were situated assisted managers in undertaking targeted corrective action in their own programs. All four countries formulated small operations research studies to develop and test new strategies. Table 4-1 provides a list of the 14 small operations research studies that were conducted.

Table 4-1
Operations Research as Outcome of Malaria Systems Analysis

Country	Problem	OR Study	Date/Duration
Niger	No chloroquine in VHW drug kits in 48% of villages visited	Study to analyze problem of drug kit management in order to improve availability	3/90-6/90
	Lack of community support for VHW activities	Study to analyze possibilities of increasing community support for drug resupply, VHW refresher training, and VHW morale	4/90-6/90
	Neglect of technical support for malaria during supervisory visits	Redesign of training programs for supervisors of village health workers in malaria activities	ongoing
Senegal	Health worker performance for malaria was overestimated by supervisors.	Development of a supervision guide for departmental supervisors	3/90-10/90
	Supervisors not identifying service delivery problems	Development of a training course for departmental supervisors	3/90-10/90
Zaire	Few active methods used in group health education sessions	Development of supervisory methods for health education, including the use of checklists HW self assessment, and feedback	10/88 - 4/89
	Utilization of malaria services in villages is low, due to lack of knowledge and access	Strengthen home visiting by CHWs through training of CHWs and development of supervisory checklist and feedback	8/88-11/89
	Health worker education of the mother in use of chloroquine for febrile children	Development of messages and health education strategies for education of mothers in malaria (three health zones)	6/88 - 11/88
	Supervisors focus solely on record review and delivering services themselves during supervision visits	Development of a supervisory strategy to improve primary health care service delivery for malaria (two health zones)	7/89 - 12/89
Pakistan	Case management of malaria is inadequate, especially clinical assessment and counseling	Development of job aids, as reminders to health workers, for the improved malaria case management	8/89 - 9/89
	Supervisory activities are unstructured and include little observation of malaria service delivery	Strengthen the supervisory system and develop supervisory checklists for observation of the management of malaria	Proposed

In Niger, for example, specific treatment deficiencies are being addressed through in-service training and the promotion of wider chloroquine availability in the village. Several small operations research studies are testing different training methods and configurations in order to propose recommendations for changes in national VHW training protocols. One study has looked at the possibilities for increasing community support for VHWs. Another study investigated chloroquine supply problems at village level.²

In Senegal and Zaire, efforts were directed at strengthening malaria supervisory systems through the development of handbooks, supervisory checklists, and training modules. In Senegal, one study developed and tested training programs for supervisors.

Several operations research studies in Zaire have sought to develop health education messages to improve home treatment of fever. Another study in Zaire developed and tested educational modules for treatment of malaria in children under the age of 5. One study investigated ways of improving utilization of malaria services through the use of intensive home visiting by CHWs.

In Pakistan, program managers developed and tested job aids to help workers remember their malaria tasks. The Ministry of Health has recommended developing checklists for malaria similar to those used in EPI to be used by health workers and supervisors alike. They also recommended developing job descriptions and strengthening the treatment of malaria in the basic training curricula for health personnel.

Appendix 2 contains short descriptions of the types of problems and solutions managers tackled with operations research for improving malaria activities.

These 14 operations research studies addressing issues with malaria treatment attest to the fact that managers can find solutions to problems once they are identified. The systems analyses provided managers with the framework for understanding where their malaria treatment systems were weak and where they could focus their efforts. These operations research experiences have shown that:

- It is possible to improve supervision through the local development of supervisory tools, such as checklists.
- Community-based workers can be used more effectively if they are trained and supervised for health education.
- Health education and counseling can be improved, especially if worker knowledge is framed in the same language as mothers' knowledge (e.g., treatment dosages by age rather than by weight).
- Problem-solving can be improved by examining the problems more closely (e.g., community support and drug supply).

4.3 RECOMMENDATIONS FOR FUTURE DIRECTIONS

This comparative review was designed to bring together information on the performance of malaria treatment and education in a number of diverse countries in order to draw some conclusions about where malaria programs may need to place their efforts in the coming years. Integrating malaria treatment into the PHC system has increased access for much of the rural population. However,

the results from these five systems analyses expose many quality-of-care problems. Two major areas of inadequacy are common across all countries studied, indicating that they are probably weak in other countries as well. This commonality argues for new efforts at strengthening these areas:

- clear protocols for clinical assessment and treatment, and
- technical supervision.

There is a need to develop simple protocols for clinical assessment of fever origin so that, by process of elimination, anti-malarial drugs can be given only for fevers of unknown origin. There appears to be some ambiguity about the health worker's responsibility in searching for alternative diagnoses when faced with a patient with fever. This is especially true where antimalarials are to be given for all fever cases in young children and pregnant women. With increasing chloroquine resistance, health workers must use more expensive and toxic antimalarials. This, in turn, reinforces the need to limit antimalarial use to those cases which really need them.³

Increasing parasite resistance to chloroquine also argues for instituting laboratory confirmation and referral facilities for "failed" treatments. Treatment protocols are also not clear, with many different dosages and durations of treatment being used in the same country. This means that more care needs to be taken in communicating current malaria protocols.

Finally, if the quality of malaria treatment is to be improved, more effort needs to be made to improve the supervision and training systems so that these protocols can be communicated and taught to workers already in the field, and to monitor how well they are able to implement these protocols. This means that supervisors must be imparted with the skills and tools to identify problems in worker performance and to address them as they arise.

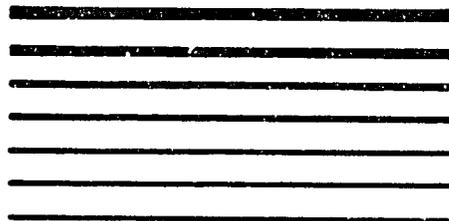
¹ "Niger: Assessment of Malaria Control," report prepared by Alfred Buck and Norman Gatz for the Vector Biology and Control Project, 1990; Baudon, D. et al, "A Study of malaria morbidity in a rural area of Burkina Faso," Transactions of the Royal Society of Tropical Medicine and Hygiene, V. 79, pp. 283-284, (1985), cited in "Practical Chemotherapy of Malaria," WHO Technical Report Series, No. 805 (1990).

² The operations research studies in Niger are financed by the Ministry of Health counterpart funds from a USAID Health Sector Development grant, with technical support financed through PRICOR. All other studies were funded through the PRICOR Project.

³ WHO, "Practical Chemotherapy of Malaria," WHO Technical Report Series, No. 805, Geneva: WHO (1990).

PRICOR

**PRIMARY
HEALTH CARE
THESAURUS**



VOLUME I

Malaria
Service
ACTIVITIES

*Version 1.2
May 1, 1988*

CENTER FOR HUMAN SERVICES

Primary Health Care Operations Research Project
Supported by the U.S. Agency for International Development

MALARIA
SERVICE DELIVERY ACTIVITIES, TASKS AND SUBTASKS
Treatment

1. IDENTIFY PREGNANT WOMEN AND/OR CHILDREN UNDER 5 NEEDING MALARIA TREATMENT SERVICES

2. MANAGE MALARIA CASES

2.1 DIAGNOSE MALARIA OR OTHER FEVER-RELATED ILLNESSES

2.1.1 TAKE MEDICAL HISTORY

2.1.1.1 Ask about level of fever

2.1.1.2 Ask about pattern of fever

2.1.1.3 Ask about chills/sweats

2.1.1.4 Ask about headache

2.1.1.5 Ask about vomiting

2.1.1.6 Ask about convulsions (cerebral malaria)

2.1.1.7 Ask about antimalarial drug administration in last 24 hours

2.1.1.8 Ask about the following to rule out other fever-related illnesses:

2.1.1.8.1 Ask about diarrhea

2.1.1.8.2 Ask about cough

2.1.1.8.3 Ask about runny nose/sore throat

2.1.1.8.4 Ask about ear pain

2.1.1.8.5 Ask about urinary symptoms (dysuria, frequency)

2.1.1.8.6 Ask about joint pain or swelling

2.1.2 CONDUCT PHYSICAL EXAMINATION

2.1.2.1 Take temperature

2.1.2.2 Examine neck for stiffness

2.1.2.3 Palpate abdomen/stomach

2.1.2.4 Auscultate lungs (per local policy)

2.1.2.5 Examine ears, nose, throat

2.1.2.6 Examine skin

2.1.2.7 Weigh patient

2.1.3 PERFORM LABORATORY TESTS

- 2.1.3.1 Make blood slide (per local policy)
- 2.1.3.2 Examine blood slide (per local policy)
- 2.2 ADMINISTER APPROPRIATE TREATMENTS PER PATIENTS' DIAGNOSES AND PER LOCAL POLICY**
 - 2.2.1 ADMINISTER ANTIMALARIAL DRUGS**
 - 2.2.1.1 Administer appropriate antimalarial drug per recommended (presumptive or radical treatment) schedule (locally determined)
 - 2.2.1.2 Prescribe or distribute appropriate antimalarial drug for home administration per recommended treatment schedule (locally determined)
 - 2.2.2 ADMINISTER SUPPORTIVE TREATMENTS FOR HYPERPYREXIA IF FEVER IS OVER 39 DEGREES CENTIGRADE**
 - 2.2.2.1 Administer antipyretic drug
 - 2.2.2.2 Sponge or bathe with water
- 2.3 COUNSEL (EXPECTANT) MOTHERS* (SEE MALARIA: SERVICE DELIVERY TREATMENT - 2.1 PROVIDE INDIVIDUAL COUNSELLING TO MALARIA CASES OR MOTHERS OF MALARIA CASES)**
- 2.4 REFER FEVER CASES**
 - 2.4.1 REFER CASE OF CEREBRAL OR OTHER SERIOUS/COMPLICATED OR UNRESPONSIVE MALARIA
 - 2.4.2 REFER FOR FURTHER DIAGNOSIS/OTHER TREATMENT IF OTHER SERIOUS FEVER-RELATED ILLNESS IS SUSPECTED, E.G. MENINGITIS, TYPHOID, OR DENGUE FEVER
 - 2.4.3 REFER SUSPECTED MALARIA CASE TO A HIGHER LEVEL HEALTH FACILITY FOR A BLOOD SLIDE (PER LOCAL POLICY)
- 2.5 MAKE AND EXAMINE BLOOD SLIDES AT APPROPRIATE INTERVALS (LOCALLY DETERMINED) DURING DRUG THERAPY TO DETERMINE CHANGE IN PARASITE COUNT AND DETECT ANY RESISTANCE TO ANTIMALARIAL DRUG BEING USED (PER LOCAL POLICY)**
- 3. MOTIVATE/EDUCATE MOTHERS AND OTHER COMMUNITY MEMBERS REGARDING MALARIA TREATMENT**
 - 3.1 PROVIDE INDIVIDUAL COUNSELLING TO MALARIA CASES OR MOTHERS OF MALARIA CASES**
 - 3.1.1 TRANSMIT KEY MESSAGES ABOUT MALARIA TREATMENT**
 - 3.1.1.1 Tell (expectant) mother how to administer antimalarial drug prescribed or distributed for home administration
 - 3.1.1.2 Tell (expectant) mother when to return for the next drug administration at service delivery facility

*The term "(expectant) mothers" refers to both pregnant women and mothers of children under 5 identified by health workers as fever cases.

- 3.1.1.3 Tell observed (expectant) mother the importance of completing entire treatment course
- 3.1.1.4 Tell (expectant) mother the signs and symptoms of unresponsive and complicated malaria
 - 3.1.1.4.1 Tell (expectant) mother about unconsciousness, severe drowsiness
 - 3.1.1.4.2 Tell (expectant) mother about fever continuing for more than two days after initiation of treatment
 - 3.1.1.4.3 Tell (expectant) mother about any relapse of fever within three weeks after initiation of treatment
 - 3.1.1.4.4 Tell (expectant) mother about jaundice
- 3.1.1.5 Tell (expectant) mother to return for consultation if signs of unresponsive or complicated malaria develop
- 3.1.1.6 Tell (expectant) mother how to prevent malaria by chemoprophylaxis and by other methods, such as the use of mosquito nets, household spraying, and eliminating standing water
- 3.1.2 USE APPROPRIATE INDIVIDUAL COUNSELLING TECHNIQUES
 - 3.1.2.1 Ask mother to repeat key messages
 - 3.1.2.1.1 Ask (expectant) mother to repeat the administration schedule for antimalarial drug prescribed or distributed for home administration
 - 3.1.2.1.2 Ask (expectant) mother to repeat when to return for the next drug administration at service delivery facility
 - 3.1.2.1.3 Ask (expectant) mother to repeat under what circumstances to return for consultation
 - 3.1.2.2 Give (expectant) mother written, including pictorial, instructions for administering antimalarial drug prescribed or distributed for home administration
 - 3.1.2.3 Ask (expectant) mother if she has any questions
- 3.2 PROVIDE OUTREACH MALARIA TREATMENT EDUCATION
 - 3.2.1 TRANSMIT KEY MESSAGES
 - 3.2.1.1 Explain malaria signs and symptoms, especially fever
 - 3.2.1.2 Explain importance of immediate treatment of malaria (fever) in the home
 - 3.2.1.3 Explain which drug(s) should be used to treat fever in the home
 - 3.2.1.4 Explain recommended antimalarial drug administration schedule (treatment)
 - 3.2.1.5 Explain indications for seeking medical care (locally determined)
 - 3.2.2 USE APPROPRIATE HEALTH EDUCATION TECHNIQUES AND MATERIALS
 - 3.2.2.1 Ask questions of and respond to questions from attendees
 - 3.2.2.2 Use visual aids in transmitting key messages

Chemoprophylaxis

1. **CHANNEL PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY TO CHEMOPROPHYLAXIS SERVICES)**
 - 1.1 **IDENTIFY PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY)**
 - 1.1.1 **SEEK TO IDENTIFY PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) AT CLINIC SESSIONS**
 - 1.1.2 **SEEK TO IDENTIFY PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) DURING HOME VISITS**
 - 1.1.3 **MAINTAIN RECORDS WHICH IDENTIFY ALL WOMEN AGED 15-44 AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY)**
 - 1.2 **RECRUIT PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) (SEE MALARIA: SERVICE DELIVERY - CHEMOPROPHYLAXIS - 3. MOTIVATE/EDUCATE MOTHERS AND OTHER COMMUNITY MEMBERS REGARDING MALARIA PREVENTION)**
 - 1.3 **DIRECT PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) TO SOURCES OF CHEMOPROPHYLAXIS SERVICES**
 - 1.3.1 **DIRECT PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) IDENTIFIED AT CLINIC SESSIONS TO SOURCES OF CHEMOPROPHYLAXIS SERVICES**
 - 1.3.2 **DIRECT PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) IDENTIFIED DURING HOME VISITS TO SOURCES OF CHEMOPROPHYLAXIS SERVICES**
 - 1.3.3 **EXPLAIN WHEN AND WHERE TO GO TO OBTAIN CHEMOPROPHYLAXIS SERVICES DURING GROUP MALARIA PREVENTION EDUCATION SESSIONS (SEE MALARIA: SERVICE DELIVERY - CHEMOPROPHYLAXIS - 3.2.1.4 EXPLAIN WHEN AND WHERE TO GO TO OBTAIN CHEMOPROPHYLAXIS SERVICES)**
2. **PROVIDE CHEMOPROPHYLAXIS**
 - 2.1 **ADMINISTER ANTIMALARIAL DRUGS**
 - 2.1.1 **ADMINISTER APPROPRIATE ANTIMALARIAL DRUG PER RECOMMENDED SCHEDULE (LOCALLY DETERMINED)**
 - 2.1.2 **PRESCRIBE OR DISTRIBUTE APPROPRIATE ANTIMALARIAL DRUG FOR HOME ADMINISTRATION PER RECOMMENDED SCHEDULE (LOCALLY DETERMINED)**
 - 2.2 **COUNSEL (EXPECTANT) MOTHERS** (SEE MALARIA: SERVICE DELIVERY - CHEMOPROPHYLAXIS - 3.1 PROVIDE INDIVIDUAL COUNSELLING TO PREGNANT WOMEN AND/OR MOTHERS OF CHILDREN RECEIVING CHEMOPROPHYLAXIS)**
3. **MOTIVATE/EDUCATE MOTHERS AND OTHER COMMUNITY MEMBERS REGARDING MALARIA PREVENTION**
 - 3.1 **PROVIDE INDIVIDUAL COUNSELLING TO PREGNANT WOMEN AND/OR MOTHERS OF CHILDREN RECEIVING CHEMOPROPHYLAXIS**

**The term "(expectant) mothers" refers to both pregnant women and mothers of children under 5 receiving chemoprophylaxis.

3.1.1 TRANSMIT KEY MALARIA PREVENTION MESSAGES

- 3.1.1.1 Tell (expectant) mother why is it especially important that she (or her child) receive chemoprophylaxis
- 3.1.1.2 Tell (expectant) mother what antimalarial drug has been prescribed or distributed for home administration
- 3.1.1.3 Tell (expectant) mother how to administer antimalarial drug prescribed or distributed for home administration
- 3.1.1.4 Tell (expectant) mother when to return for next antimalarial drug administration at service delivery facility
- 3.1.1.5 Tell (expectant) mother the possible side effects of antimalarial drug(s)
- 3.1.1.6 Tell (expectant) mother about other methods of malaria prevention, such as the use of mosquito nets, household spraying, eliminating standing water, etc.

3.1.2 USE APPROPRIATE INDIVIDUAL COUNSELLING TECHNIQUES**3.1.2.1 Ask (expectant) mother to repeat key messages**

- 3.1.2.1.1 Ask mother to repeat the administration schedule for antimalarial drug prescribed or distributed for home administration
- 3.1.2.1.2 Ask (expectant) mother to repeat when she should return for the next antimalarial drug administration at service delivery facility

3.1.2.2 Give (expectant) mother written, including pictorial, instructions for administering antimalarial drug prescribed or distributed for home administration**3.1.2.3 Ask (expectant) mother if she has any questions****3.2 PROVIDE OUTREACH MALARIA PREVENTION EDUCATION****3.2.1 TRANSMIT KEY MESSAGES**

- 3.2.1.1 Explain the importance of chemoprophylaxis for pregnant women and/or children under 5 (per local policy)
- 3.2.1.2 Explain which drug(s) can be used for malaria prevention
- 3.2.1.3 Explain recommended antimalarial drug administration schedule (chemoprophylaxis)
- 3.2.1.4 Explain when and where to go to obtain chemoprophylaxis services
- 3.2.1.5 Explain other malaria prevention techniques, such as the use of mosquito nets, household spraying, eliminating standing water, etc.

3.2.2 USE APPROPRIATE HEALTH EDUCATION TECHNIQUES AND MATERIALS

- 3.2.2.1 Ask questions of and respond to questions from attendees
- 3.2.2.2 Use visual aids in transmitting key messages

MALARIA TRAINING ACTIVITIES, TASKS AND SUBTASKS

- 1. PLAN MALARIA TREATMENT AND PREVENTION TRAINING**
 - 1.1 ASSESS MALARIA TREATMENT AND PREVENTION TRAINING NEEDS**
 - 1.2 SET OBJECTIVES AND TARGETS FOR MALARIA TREATMENT AND PREVENTION TRAINING**
 - 1.3 SELECT MALARIA TREATMENT AND PREVENTION TRAINING MATERIALS AND METHODS**

- 2. TRAIN HEALTH WORKERS IN MALARIA TREATMENT AND PREVENTION TASKS**
 - 2.1 TRANSMIT KEY MALARIA TREATMENT AND PREVENTION INFORMATION AND REQUIRED SKILLS PER TRAINEES' MALARIA TASKS**
 - 2.1.1 TEACH HOW TO DIAGNOSE MALARIA**
 - 2.1.2 TEACH HOW TO DIAGNOSE OTHER FEVER-RELATED ILLNESSES**
 - 2.1.3 TEACH RECOMMENDED MALARIA TREATMENT PROTOCOL**
 - 2.1.4 TEACH POSSIBLE SIDE EFFECTS OF ANTIMALARIAL DRUGS**
 - 2.1.5 TEACH HOW TO MAKE AND EXAMINE BLOOD SLIDES (PER LOCAL POLICY)**
 - 2.1.6 TEACH IMPORTANCE OF CHEMOPROPHYLAXIS FOR PREGNANT WOMEN AND CHILDREN UNDER 5 (PER LOCAL POLICY)**
 - 2.1.7 TEACH RECOMMENDED MALARIA CHEMOPROPHYLAXIS SCHEDULE**
 - 2.1.8 TEACH USE OF COUNSELLING AND HEALTH EDUCATION TECHNIQUES AND MATERIALS**
 - 2.1.9 TEACH PROCEDURES FOR COUNSELLING PREGNANT WOMEN AND/OR CHILDREN UNDER 5 (PER LOCAL POLICY) TO CHEMOPROPHYLAXIS SERVICES**
 - 2.1.10 TEACH METHODS FOR DETERMINING QUANTITIES OF ANTIMALARIAL DRUGS TO ORDER**
 - 2.1.11 TEACH PROCEDURES FOR MAINTAINING MALARIA TREATMENT AND CHEMOPROPHYLAXIS RECORDS AND REPORTING MALARIA TREATMENT AND PREVENTION INFORMATION**
 - 2.2 USE APPROPRIATE TRAINING METHODS**
 - 2.2.1 DEMONSTRATE REQUIRED MALARIA TREATMENT AND PREVENTION**
 - 2.2.1.1 Demonstrate how to make and examine blood slides (per local policy)**
 - 2.2.1.2 Demonstrate counselling and health education**
 - 2.2.2 ASK QUESTIONS OF AND RESPOND TO QUESTIONS FROM TRAINEES**
 - 2.2.3 USE VISUAL AIDS IN TRANSMITTING KEY INFORMATION**

- 2.2.4 PROVIDE OPPORTUNITIES FOR TRAINEES TO PRACTICE TREATING MALARIA DURING TRAINING
- 2.2.5 GIVE TRAINEES WRITTEN, INCLUDING PICTORIAL, REFERENCE MATERIALS ON MALARIA TREATMENT AND PREVENTION
- 2.3 **TEST COMPETENCE OF TRAINEES IN MALARIA TREATMENT AND PREVENTION TASKS**
 - 2.3.1 TEST TRAINEE KNOWLEDGE OF RECOMMENDED MALARIA TREATMENT PROTOCOL BY: (1) OBSERVING WHETHER THEY FOLLOW THE RECOMMENDED PROTOCOL WHEN TREATING MALARIA CASES (IN CONSULTATION SESSIONS OR IN ROLE-PLAY EXERCISES); OR (2) ADMINISTERING WRITTEN OR ORAL TESTS OF THE RECOMMENDED PROTOCOL
 - 2.3.2 TEST TRAINEE KNOWLEDGE OF RECOMMENDED MALARIA CHEMOPROPHYLAXIS SCHEDULE BY: (1) OBSERVING WHETHER THEY FOLLOW THE RECOMMENDED SCHEDULE WHEN PROVIDING CHEMOPROPHYLAXIS (IN CONSULTATION SESSIONS OR IN ROLE-PLAY EXERCISES); OR (2) ADMINISTERING WRITTEN OR ORAL TESTS OF THE RECOMMENDED SCHEDULE
 - 2.3.3 TEST TRAINEE SKILL IN TAKING AND/OR EXAMINING BLOOD SLIDES (PER LOCAL POLICY) BY: (1) OBSERVING WHETHER THEY FOLLOW RECOMMENDED PROCEDURES WHEN TAKING BLOOD SLIDES (IN CONSULTATION SESSIONS); (2) ADMINISTERING WRITTEN OR ORAL TESTS OF RECOMMENDED PROCEDURES FOR MAKING BLOOD SLIDES; (3) REEXAMINING BLOOD SLIDES EXAMINED BY TRAINEES; AND/OR (4) ADMINISTERING WRITTEN OR ORAL TEST OF IDENTIFYING CHARACTERISTICS OF DIFFERENT MALARIAL PARASITES
- 3. **EVALUATE MALARIA TREATMENT AND PREVENTION**
 - 3.1 **TEST COMPETENCE OF TRAINEES IN MALARIA TREATMENT AND PREVENTION TASKS (SEE MALARIA: TRAINING--2.3 TEST COMPETENCE OF TRAINEES IN MALARIA TREATMENT AND PREVENTION TASKS)**
 - 3.2 **ASSESS HEALTH WORKER MALARIA TREATMENT AND PREVENTION TASK PERFORMANCE (SEE MALARIA: SUPERVISION; INFORMATION SYSTEM, MONITORING AND EVALUATION)**
- 4. **MAINTAIN MALARIA TREATMENT AND PREVENTION TRAINING RECORDS AND REPORT MALARIA TREATMENT AND PREVENTION TRAINING INFORMATION (SEE MALARIA: INFORMATION SYSTEM, MONITORING AND EVALUATION)**

MALARIA SUPERVISION ACTIVITIES, TASKS AND SUBTASKS

1. PLAN SUPERVISION ACTIVITIES

- 1.1 ASSESS SUPERVISION NEEDS
- 1.2 SET SUPERVISION OBJECTIVES AND TARGETS
- 1.3 DEVELOP SUPERVISION SCHEDULES AND WORKPLANS
- 1.4 COMMUNICATE SUPERVISION SCHEDULES AND RESPONSIBILITIES
- 1.5 PROVIDE LOGISTIC SUPPORT FOR SUPERVISION ACTIVITIES
- 1.6 COMMUNICATE SUPERVISION SCHEDULES AND RESPONSIBILITIES

2. SUPERVISE MALARIA TREATMENT AND PREVENTION SERVICE DELIVERY AND SUPPORT ACTIVITIES

- 2.1 ASSIST HEALTH WORKERS IN ORGANIZING AND PLANNING MALARIA TREATMENT AND PREVENTION TASKS
 - 2.1.1 SET OR COMMUNICATE DESIRED MALARIA TREATMENT AND PREVENTION OBJECTIVES AND TARGETS
 - 2.1.2 DEVELOP MALARIA TREATMENT AND PREVENTION WORKPLANS
 - 2.1.3 DEVELOP OR CLARIFY STANDARDS FOR MALARIA TREATMENT AND PREVENTION TASK PERFORMANCE
- 2.2 IDENTIFY MALARIA TREATMENT AND PREVENTION SERVICE DELIVERY AND SUPPORT PROBLEMS AND STRONG POINTS
 - 2.2.1 ASSESS ATTAINMENT OF DESIRED MALARIA TREATMENT RATE AND/OR FREQUENCY OF MALARIA TREATMENT SERVICE DELIVERY ACTIVITIES
 - 2.2.1.1 Assess attainment of desired malaria treatment rate by: (1) reviewing service delivery facility records to obtain data on the proportion of fever cases in pregnant women and children under 5 treated with antimalarial drugs; or (2) conducting sample household surveys
 - 2.2.1.2 Assess frequency of outreach malaria treatment education activities by: (1) reviewing service delivery facility records to obtain data on the number of home visits made and/or group malaria treatment education sessions held; (2) interviewing community leaders and members about the frequency of group malaria treatment education sessions; or (3) asking health workers about the frequency of outreach malaria treatment education activities
 - 2.2.2 ASSESS ATTAINMENT OF MALARIA CHEMOPROPHYLAXIS TARGETS, IF PRESENT, AND/OR FREQUENCY OF MALARIA PREVENTION SERVICE DELIVERY ACTIVITIES
 - 2.2.2.1 Assess attainment of chemoprophylaxis targets by: (1) reviewing service delivery facility records to obtain data on the proportion of pregnant women and/or children under 5 (per local policy) provided chemoprophylaxis, or (2) conducting sample household chemoprophylaxis coverage surveys

- 2.2.2.2 Assess occurrence and frequency of chemoprophylaxis channelling activities by: (1) observing whether health workers identify pregnant women and/or children under 5 (per local policy) during clinic sessions and/or home visits and whether they direct these women and/or children to sources of chemoprophylaxis services; (2) observing whether records identifying all women aged 15-44 and/or children under 5 (per local policy) are maintained; (3) reviewing service delivery facility records to obtain data on the number of group malaria prevention education sessions held and/or home visits made; (4) interviewing community leaders and members about the frequency of group malaria prevention education sessions; or (5) asking health workers about the frequency of chemoprophylaxis channelling activities

2.2.3 ASSESS QUALITY OF MALARIA TREATMENT SERVICE DELIVERY ACTIVITIES

- 2.2.3.1 Assess whether health workers administer antimalarial drugs to all fever cases (per local policy) by observing health workers treat fever cases (in consultation sessions or in role-play exercises)
- 2.2.3.2 Assess whether health workers follow the recommended antimalarial drug administration schedule (treatment) by: (1) observing health workers treat fever cases (in consultation sessions or in role-play exercises); (2) reviewing records to obtain data on the proportion of cases where the administration schedule was correctly followed; or (3) interviewing health workers to determine whether they know the recommended administration schedule
- 2.2.3.3 Assess whether health workers tell fever cases the recommended administration schedule for antimalarial drugs prescribed or distributed for home administration by: (1) observing health workers counsel fever cases (in consultation sessions or in role-play exercises); or (2) interviewing fever cases leaving consultation sessions to determine whether they know the recommended administration schedule
- 2.2.3.4 Assess whether health workers are effectively transmitting the message that fever should be treated immediately with antimalarial drugs by: (1) observing health workers provide outreach malaria treatment education (in group malaria treatment education sessions, in home visits, or in role-play exercises); or (2) interviewing mothers leaving group malaria treatment education sessions and/or after home visits to determine whether they know that fever should be treated immediately with antimalarial drugs
- 2.2.3.5 Assess whether health workers correctly take and examine blood slides (per local policy) by: (1) observing health workers take blood slides (in consultation sessions); (2) testing health workers to determine whether they know correct procedures for taking blood slides; (3) reexamining blood slides examined by health workers; and/or (4) testing health workers to determine whether they know identifying characteristics of different malarial parasites

2.2.4 ASSESS QUALITY OF MALARIA CHEMOPROPHYLAXIS ACTIVITIES

- 2.2.4.1 Assess whether health workers follow the recommended antimalarial drug administration schedule (chemoprophylaxis) by: (1) observing health workers provide chemoprophylaxis (in clinic sessions or in role-play exercises); (2) reviewing records to obtain data on the proportion of cases where the administration schedule was correctly followed; or (3) interviewing health workers to determine whether they know the recommended administration schedule

- 2.2.4.2 Assess whether health workers tell chemoprophylaxis recipients the recommended administration schedule for antimalarial drugs prescribed or distributed for home administration by: (1) observing health workers counsel chemoprophylaxis recipients (in clinic sessions or in role-play exercises); or (2) interviewing chemoprophylaxis recipients leaving clinic sessions to determine whether they know the recommended administration schedule
- 2.2.4.3 Assess whether health workers are effectively transmitting the message that chemoprophylaxis is especially important for pregnant women and/or children under 5 (per local policy) by: (1) observing health workers counsel pregnant women and/or mothers of children under 5 (in clinic sessions or in role-play exercises); (2) interviewing pregnant women and/or mothers of children under 5 leaving consultation sessions to determine if they know that it is important for them or their children to receive chemoprophylaxis; (3) observing health workers provide outreach malaria prevention education (in group malaria prevention education sessions, in home visits or in role-play exercises); or (4) interviewing women leaving group malaria prevention education sessions and/or after home visits to determine whether they know that it is important for pregnant women and/or children under 5 to receive chemoprophylaxis
- 2.2.5 ASSESS QUALITY OF MALARIA TREATMENT AND PREVENTION SUPPORT ACTIVITIES
 - 2.2.5.1 Assess whether the service delivery facility has adequate quantities of antimalarial drugs by: (1) observing quantities of antimalarial drugs available (at the service delivery facility); or (2) asking health workers about shortages of antimalarial drugs
 - 2.2.5.2 Assess whether health workers are adequately maintaining malaria treatment and chemoprophylaxis records by reviewing malaria treatment and chemoprophylaxis records for completeness and correctness of information
- 2.3 ASSIST IN RESOLVING MALARIA TREATMENT AND PREVENTION SERVICE DELIVERY AND SUPPORT PROBLEMS IDENTIFIED
 - 2.3.1 PROVIDE IMMEDIATE FEEDBACK ON MALARIA TREATMENT AND PREVENTION PERFORMANCE
 - 2.3.1.1 Praise or otherwise reward good malaria treatment and prevention performance
 - 2.3.1.2 Advise or instruct health workers how to improve poor malaria treatment and prevention performance
 - 2.3.1.3 Provide direct assistance in performing malaria treatment and prevention tasks
 - 2.3.2 TAKE FOLLOW-UP ACTION ON MALARIA TREATMENT AND PREVENTION PERFORMANCE
 - 2.3.2.1 Provide or arrange for formal malaria treatment and prevention in-service training
 - 2.3.2.2 Provide malaria treatment and prevention logistic support, if applicable
 - 2.3.2.2.1 Provide antimalarial drugs and/or blood slide equipment and supplies
 - 2.3.2.2.2 Provide reference materials on malaria treatment and prevention
 - 2.3.2.3 Refer persistent malaria treatment and prevention performance problems to higher-level supervisors

- 2.3.2.4 Apply sanctions for poor malaria treatment and prevention performance, if applicable
- 2.4 **MOTIVATE HEALTH WORKERS (SEE MALARIA: SUPERVISION -- 2.3 ASSIST IN RESOLVING MALARIA TREATMENT AND PREVENTION SERVICE DELIVERY AND SUPPORT PROBLEMS IDENTIFIED)**
- 3. **EVALUATE SUPERVISION OF MALARIA TREATMENT AND PREVENTION SERVICE DELIVERY AND SUPPORT ACTIVITIES**
 - 3.1 **ASSESS FIRST-LEVEL SUPERVISOR SUPERVISION TASK PERFORMANCE**
 - 3.2 **ASSESS HEALTH WORKER MALARIA TREATMENT AND PREVENTION TASK PERFORMANCE (SEE MALARIA: SUPERVISION; INFORMATION SYSTEM, MONITORING AND EVALUATION)**
- 4. **MAINTAIN SUPERVISION RECORDS AND REPORT SUPERVISION INFORMATION (SEE MALARIA: INFORMATION SYSTEM, MONITORING AND EVALUATION)**

MALARIA LOGISTIC SUPPORT ACTIVITIES, TASKS AND SUBTASKS

Antimalarial Drugs (Chloroquine, Sulphadoxine with Pyrimethamine, Quinine)

Blood Slide Equipment and Supplies (Slides, Lancets or Needles, Stain, Microscopes)

- 1. PLAN MALARIA TREATMENT AND PREVENTION LOGISTIC SUPPORT ACTIVITIES**
 - 1.1 DEVELOP POLICY ON QUANTITIES OF ANTIMALARIAL DRUGS TO BE ORDERED OR ISSUED**
 - 1.2 DEVELOP PROCEDURES FOR PROCURING ANTIMALARIAL DRUGS**
- 2. PROCURE ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
 - 2.1 ESTIMATE REQUIREMENTS FOR ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
 - 2.2 SECURE AND DISBURSE FUNDS FOR ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES, IF APPLICABLE**
 - 2.3 ORDER OR BE ISSUED ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
 - 2.4 COLLECT OR RECEIVE ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
- 3. STORE ANTIMALARIAL DRUGS AND STORE AND MAINTAIN BLOOD SLIDE EQUIPMENT AND SUPPLIES**
 - 3.1 ORGANIZE AND ROTATE STOCK OF ANTIMALARIAL DRUGS**
 - 3.2 STORE ANTIMALARIAL DRUGS IN A COOL, DRY PLACE**
 - 3.3 DISCARD ANTIMALARIAL DRUGS THAT ARE NO LONGER POTENT**
- 4. DISTRIBUTE ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
 - 4.1 RECEIVE ORDERS FOR OR ISSUE ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
 - 4.2 DELIVER ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES**
- 5. MAINTAIN INVENTORY AND EQUIPMENT RECORDS FOR ANTIMALARIAL DRUGS AND BLOOD SLIDE EQUIPMENT AND SUPPLIES (SEE MALARIA: INFORMATION SYSTEM, MONITORING AND EVALUATION)**

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APPENDIX 2 -- OPERATIONS RESEARCH STUDIES CONCERNING MALARIA TREATMENT

This appendix contains short summaries of the operations research studies carried out under the PRICOR Project that addressed problems in malaria treatment. They are organized by subject: Improving health education, testing job aids, developing and testing supervisory tools, developing supervisory training, improving chloroquine supply at village level, improving utilization of malaria services, and increasing community support.

1. OPERATIONS RESEARCH STUDIES TO IMPROVE HEALTH EDUCATION AND HOME TREATMENT OF FEVERS

In Zaire, the doses of chloroquine that mothers administer to children at home are generally too low to be effective. Thus, medical officers in three health zones conducted similar operations research studies to develop appropriate messages and health education strategies to teach mothers the correct use of chloroquine for febrile children. In one zone, the intervention included a 3-day training for health workers on treatment and communication, a supervision strategy based on observation, and the development of a new educational message. To test the solution, interviews were conducted with 50 mothers (10 women selected from growth monitoring sessions of 5 health centers) and 5 health workers (in each health zone) both before and after the intervention. A review of medical records revealed that nurses prescribe according to weight rather than age. This meant that health workers were not able to counsel mothers on the amount they should give, based on age. The pretest revealed a significant lack of knowledge among both health workers and mothers regarding the correct dosage of chloroquine according to age. Following the training of health workers and the introduction of a clearer message, three supervisory visits were conducted at 1-month intervals, followed by a final posttest. The number of mothers knowing precisely the correct chloroquine dosages increased dramatically--from 0% in the pretest to 82% in the final posttest. Health worker ability to prescribe dosages according to age rose from 20% in the pretest to 100% in the final supervision visit.

In a second health zone, the intervention consisted of training health center personnel using two educational modules which were developed by the researchers. One addressed the treatment of malaria in children under the age of 5; the other was on communication in health education. Additionally, supervision of health workers was increased, and educational messages explaining malaria treatment were developed in Lingala (the national language) and disseminated through flyers and posters. The knowledge of 50 mothers (10 women selected from growth monitoring sessions of 5 health centers) and 12 health workers was tested both before and after the intervention. A marked improvement was noted in the knowledge of both health workers and mothers following the in-service training and health education sessions. In the pretest, only 1 of 12 nurses knew correct dosages for chloroquine by age; in the posttest, all had correct knowledge. In the pretest none of the mothers knew appropriate dosages, while 82% had the correct knowledge in the posttest. Observation of health workers following the intervention showed nurses appropriately counseling mothers in 98% of cases. A review of 10 records in each of 5 health centers indicated correct prescription of chloroquine in 47 of 50 cases.

In the third zone, it was decided to use an alternative channel to the health system to pass educational messages: the Catholic Church. Messages were developed and promulgated at mass

once a month, twice a month in the weekly neighborhood church organization meetings, and through flyers distributed after mass and the meetings. Both chloroquine and aspirin were stocked by the presidents of the neighborhood church organizations for sale to parishioners. The results showed that the percentage of mothers correctly using chloroquine for 3 days rose from 10% to 22% (N=286), while home treatment increased from 40% to 48%.

2. OPERATIONS RESEARCH STUDIES TO DEVELOP AND TEST TOOLS TO HELP HEALTH WORKERS REMEMBER THEIR TASKS

Following the systems analysis in the Regi Model Basic Health Unit, the provincial health secretariat in the Northwest Frontier Province (NWFP) designed two memory aids to help guide health workers: 1) a series of task lists, one for each intervention, to be placed under Plexiglass on each practitioner's desk, for ready reference; and 2) an outpatient slip, redrafted to include spaces to record key tasks in a provider-patient encounter. A rapid followup survey was conducted 30 days later, consisting of exit interviews with 153 patients. Scores increased considerably on assessment procedures, particularly for malaria and ORT services; some improvement was suggested as well on specific, high priority counseling items, although counseling remained weak overall. Recommendations from this study included continued systematic attention to technical supervision and use by health workers of the reference task lists, consistent reinforcement of the importance of patient counseling and health education by officials and supervisors, and targeted OR on how to make supervisory practice more effective.

3. OPERATIONS RESEARCH STUDIES TO DEVELOP AND TEST SUPERVISORY TOOLS

In Senegal, one study was designed to develop and test a supervision guide which would provide supervisors with service delivery protocols as well as instructions on how to develop instruments and assess health worker performance. Protocols for inclusion in the guide were developed for four interventions: ORT, malaria, immunization, and record review of consultation registers. Supervisors in three departments were given the guide. They were then accompanied by the research team on a supervision visit, where the researchers, using a copy of the instrument developed by the supervisor, conducted the same observations as the supervisor in order to assess how well the supervisor was able to identify problems. A total of 13 supervision instruments were developed by supervisors during the test phase of the study, although a few supervisors used the protocol presented in the guide as their instrument. Only six were felt to be sufficiently detailed to aid supervisors in problem-identification. Supervisors' opinions about the guide were generally positive, and only one supervisor found the guide difficult to use. Most supervisors found it easy to use, and it also permitted them to better assess the competence and performance of health workers.

In Zaire, medical officers in two health zones examined supervision in order to develop strategies for improvement in the nurses' skill levels in performing their tasks, including malaria treatment. In the first zone, inspired by the technique used in the PRICOR systems analysis, the study team set as an objective to improve supervision by encouraging direct observation of health workers carrying out their tasks, followed by feedback. To this end, they decided to create a supervisory checklist to aid in observing the work of nurses. Supervisors developed a checklist collaboratively with the nurses, after a pretest phase. Then, supervisors paid monthly, prescheduled supervisory visits, using the checklist and offering feedback. A comparison of the performance of supervisors showed an improvement in their skills and approach to supervision: supervisors were evaluated

on whether they established and communicated a clear objective for their visit, whether they observed performance, whether they identified errors and offered feedback, and whether they adhered to the supervision schedule. Performance of tasks by the health workers, as assessed by checklist indicators on history taking, weighing, examination for other signs, correct dosage, and proper counseling, also improved over the course of the 6 months: aggregated data from the four health facilities showed that proper treatment of malaria increased from 46% to 87%.

In a second zone, a checklist was developed from a list of essential tasks for vaccination, growth monitoring, and malaria and diarrhea treatment that was reviewed by experts from the appropriate national PHC program. For 3 months, performance of tasks by nurses was observed to obtain baseline data in three different clinics. After 3 months the nurses received a copy of the supervisory checklist so that they would know exactly what tasks were being evaluated. Four additional supervisory visits were then conducted. Over the 6-month course of the study, correct performance of malaria treatment increased in all three health centers: history taking, weighing, examination for other signs, correct dosage, and proper counseling. The checklists were incorporated into the supervision strategy followed throughout the zone in which this study was conducted.

Another study in Zaire addressed the lack of active communication techniques in group health education sessions through the development of evaluation tools for health education sessions. The study team, led by a professor of education, developed a supervisory tool treating eight different themes which they tested and refined in eight health centers routinely conducting health education sessions. The tool was revised to correspond to the sequence of events in a health education session. It required the supervisor to offer objective feedback on the session, the facilitator to assess his own performance, and the two to agree on strategies for improvement. The final tool was presented at the national conference of SANRU (the national agency promoting primary health care in rural zones), where 30 observers used the tool to evaluate a specially staged health education session. Results indicated near consensus on the favorable quality and utility of the tools, and requests were made for the entire set.

4. OPERATIONS RESEARCH STUDIES TO DEVELOP TRAINING FOR SUPERVISORS

Another operations research study in Senegal focused on the need to train departmental-level supervisors in supervision. A team of one Regional supervisor, one Regional trainer, and one Departmental Health Education supervisor developed a training course which they tested on nine departmental supervisors from three regions. Results of the pretest and posttest of supervisory knowledge showed a range of pretest scores between 2 and 33, with a mean score of 12 and the minimum level of acceptable performance defined by the trainers as 60. Posttest scores showed considerable improvements in knowledge with scores ranging from 39 to 70, with a mean score of 62. For the followup evaluation of the training, supervisors in one region were accompanied on three supervision visits by the researchers. Observations revealed a steady improvement in overall performance between each visit. Scores on the first observation ranged from 52 to 76, for the second observation from 60 to 88, and for the final observation from 80 to 92. Performance of specific competency areas (preparation, execution, and evaluation of supervision activities) revealed stronger performance of the execution of supervision activities than for the preparation activities, as determined by the difference in drop-off in performance between the second and third visits.

5. OPERATIONS RESEARCH STUDIES TO IMPROVE CHLOROQUINE SUPPLY AT VILLAGE LEVEL

In Niger, a problem analysis study, designed and implemented by the Ministry of Health staff of the Diarrhea Control Program and the Malaria Control Program, was conducted to identify factors associated with good VHW drug kit management in order to develop strategies for improving availability of chloroquine and ORS at village level. The research team visited 18 villages in 3 Departments. They interviewed VHWs, made an inventory of VHWs' drug kits, interviewed villagers on their perceptions of and participation in drug kit management, and interviewed drug suppliers. The results showed that villages with good drug kit management (i.e., who had either sufficient chloroquine stocks and/or sufficient money to restock) had been supervised more recently and were farther from a drug resupply point than those villages with poor drug kit management. In half the villages with good management, the VHW managed the kit in conjunction with a village leader or a cooperative, while in all the villages with poor management, the VHW had sole responsibility. Recommendations included assuring regular supervision, creating village organizational structures for managing the drug kit, and requiring that supervisors meet with villagers during their supervision activities. This study has only completed its problem-analysis phase. It has been planned to test these recommendations in a second phase.

6. OPERATIONS RESEARCH STUDIES TO IMPROVE UTILIZATION OF MALARIA AND OTHER PHC SERVICES

In Zaire, one zonal medical officer was particularly interested in poor participation in child survival services, including malaria treatment. For example, a prior study revealed that 83% of people known to have died did so without having sought care at the health center for that illness episode. Together with other health zone managers, this zonal medical officer employed nominal group technique and an interaction matrix to determine the potential causes and solutions. He then collaborated with local nurses in his Health Zone in choosing the solution to test: intensive home visits carried out by village health workers (VHWs). In each of 6 villages in which a VHW was located, 25 mothers who did not use clinic services were selected to participate in the study. A 1-week training session was held for all VHWs in the study villages on the goals and strategies for home visits, and in health education techniques and messages. Additionally, the VHWs' supervisors were provided a newly formulated supervisory checklist and encouraged to conduct visits once per week. Over the course of 6 months, the 50 mothers received a monthly home visit by a VHW, during which the VHW surveyed the mother's current understanding of health related topics and her recent participation in child survival services, and offered counseling. VHW supervisors conducted weekly supervisory visits to monitor the VHW making home visit rounds. Over the 6-month test period, mothers' knowledge and participation in PHC services improved dramatically: for example, mothers knowing the danger signs for fever rose from 20% to 75%, and utilization of curative services rose from 26% to 72%. This led the zonal medical officer to conclude that home visits carried out by well-trained, motivated village health workers can encourage increased participation in PHC services.

7. OPERATIONS RESEARCH STUDIES TO IMPROVE COMMUNITY SUPPORT OF VHW MALARIA AND PHC ACTIVITIES

In Niger, an operations research study was conducted to provide the Ad Hoc Committee in charge of revising VHW Program policy with information on the willingness of villagers to contribute to the functioning of the VHW Program and to elicit potential strategies for support. Focus group

discussions were held with villagers and VHWs in eight villages throughout the country. Supervisory nurses and drug suppliers for these villages were also interviewed. The study revealed that villagers recognized the advantages of having VHWs in their village and were amenable to providing them some support. They appreciated the role of the VHW in providing them access to treatment and drugs for malaria. Results of the focus groups suggest that the current situation (villages offering little or no support) appears to be due to the fact that no one had ever asked these villagers to participate, and the villagers had never thought about what kind of role they could or should play in supporting their VHWs. However, when concrete suggestions were made, the villagers were ready to make sacrifices and effort to improve VHW functioning. Recommendations included: 1) carrying out an information/consciousness-raising campaign to inform villagers on the types of roles they could play, and 2) using a flexible strategy for community support (villages should choose between different modes of giving support, according to their financial possibilities and their own degree of internal organization).

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RECEIVED AUG 18 1993

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