Freedom from Hunger

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Microfinance Against Malaria: Impact of Freedom from Hunger's Malaria Education When Delivered by Rural Banks in Ghana

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Acronyms

ACT	Artemesinin-based combination treatment
ANC	Antenatal Care
AOB	Asikuma-Odoben-Brakwa District
ASU+AQ	Artesunate-amodiaquine
CBD	Community-based Distribution
CDC	Centers for Disease Control
CHPS	Community-based Health and Planning Services
CU5	Children under the age of 5 years
CwE	Credit with Education
GDP	Gross Domestic Product
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IPT	Intermittent Preventative Treatment
ITN	Insecticide-Treated Bednet
MFI	Microfinance Institution
MoH	Ministry of Health
RBM	Roll Back Malaria
SP	Sulfadoxine-Pyrimethamine
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
WHO	World Health Organization
WRA	Women of Reproductive Age

MICROFINANCE AGAINST MALARIA: IMPACT OF FREEDOM FROM HUNGER'S MALARIA EDUCATION WHEN DELIVERED BY RURAL BANKS IN GHANA

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EXECUTIVE SUMMARY

Background

Malaria in Ghana is the leading cause of workdays lost to illness. Because malaria can be so damaging to the income-generating capabilities of their clients, microfinance institutions (MFIs) are seeking ways to reduce the risk. In response to its West African MFI partners, Freedom from Hunger, with a grant from the GlaxoSmith-Kline Africa Malaria Partnership, developed a dialogue-based malaria education curriculum to be integrated with the financial services of MFIs. To determine the effectiveness of the malaria education, an impact evaluation was conducted with two Rural Banks in Ghana that implemented the malaria education with their clients.

Methods

Freedom from Hunger pursued a randomized control trial evaluation of the malaria education to measure changes in knowledge, attitudes and behaviors pertaining to malaria. A baseline and follow-up survey were conducted between October 2004 and April 2006. Malaria education and diarrhea education were randomly assigned at the community level by Brakwa-Breman Rural Bank in Central Region and Afram Rural Bank in Eastern Region. Within those communities were Credit Association members who received malaria education ("malaria clients") or diarrhea education ("diarrhea clients") along with access to credit, as well as community members (non-clients) who did not receive credit or education. The purpose of this design was to allow for measurement of the added benefit of the malaria education, to account for natural information exchange in a group-lending environment, and to measure for spillovers from malaria clients to community members not participating in credit or education. Survey respondents were women of reproductive age with at least one child under the age of 6.

Results

In addition to Freedom from Hunger's malaria education, there were other malaria initiatives occurring in the program areas during the time of this study. Thus, in many indicators and for all groups studied, there were significant improvements from baseline to follow-up in knowledge and behavior.

However, malaria clients consistently improved more than both diarrhea clients and non-clients. The following indicators highlight where malaria clients excelled in relation to the other groups:

- Malaria clients were more likely to recognize that mosquitoes alone cause malaria. They were also more likely to understand the role of the parasite and were able to describe the entire transmission process compared to other groups.
- Malaria clients were more likely to know that both pregnant women and children under the age of 5 (CU5) are most vulnerable to malaria.
- Almost 100 percent of malaria clients at follow-up indicated that insecticide-treated nets (ITNs) were the best protection against malaria. Half of malaria clients owned a mosquito net and 11 percent owned an ITN. Malaria clients were more likely to own an ITN.
- Malaria clients were more likely to have women of reproductive age and children under the age of 5 sleeping under an ITN.
- Malaria clients were twice as likely to have re-treated a mosquito net in the last six months.
- The most common reasons for non-use of mosquito nets were lack of affordability and lack of local availability.
- Almost 90 percent of all malaria clients indicated they shared messages from their malaria education sessions with other members of their community, particularly regarding the role of the mosquito in malaria, the use of ITNs as the best protection, and how to treat a child with fever.

Conclusions

From a programmatic standpoint, the malaria education was a success. Despite the presence of other malaria initiatives in the program area, participants in Freedom from Hunger's malaria education saw greater marginal increases and significantly better outcomes. This indicates that the malaria education complemented the other activities to increase knowledge and positive behaviors. Yet, even the increased knowledge and behaviors often were impeded by gaps in a family's ability to access promoted prevention methods such as ITNs. Microfinance can help a family purchase an ITN; however, there needs to be coordination with initiatives to increase local availability of ITNs for sale, particularly in rural communities.

1.0 BACKGROUND

Malaria threatens 40 percent of the world's population and is endemic to the poorest countries. Approximately 60 percent of all deaths from malaria occur among the poorest 20 percent of the population. Of the 1 to 2 million malaria deaths that occur each year (WHO 2005e), 90 percent occur in sub-Saharan Africa (WHO 2003b, 17) where it accounts for 10 to 30 percent of all hospital admissions and for 10.6 percent of the disease burden (WHO 2005b).

Malaria strikes young children and pregnant women hardest. Three thousand children die from the disease every day, accounting for 15 to 25 percent of deaths for children under the age of 5 (CU5). A child surviving malaria may suffer from brain damage or paralysis. The disease contributes to learning disabilities, absenteeism in school, and reduced educational development.

Each year, approximately 25 million women become pregnant in malaria-endemic areas. Malaria is more prevalent in pregnant women than in the general population due to a pregnant woman's compromised immune system. Malaria during pregnancy is responsible for a substantial number of miscarriages, low-birthweight babies and anemia and is a leading cause of poor infant survival and development in Africa (WHO 2004). An estimated 10,000 pregnant women and 200,000 infants die each year as a result of malaria during pregnancy (WHO 2005e).

Malaria is also a particular problem for rural, poor populations where it is both a cause and result of poverty (Adams 2004, 32; Ankomah 2003, 8; WHO 2003b, 19). Poor people are at greater risk because they often lack access to effective means of prevention and treatment. Malaria contributes to poverty by reducing the productivity of infected people and their caretakers. Households spend significant sums, as much as one-quarter of their income, on medical visits to prevent and treat malaria (UNICEF 2005, 1).

Not only is malaria a particular problem for the poor, it also hinders entire countries from achieving economic growth. Economists estimate that malaria has slowed economic growth in terms of Gross Domestic Product (GDP) per capita in African countries by 1.3 percent per year (Gallup 2000, 9). Compounded over 35 years, this amounts to a 32 percent reduction in the GDP of countries in Africa where malaria is endemic and causes economic losses estimated at US$12 billion per year (DFID 2005).

Although the costs paint a grim picture, a study by Gallup and Sachs found that a 10 percent reduction in malaria was associated with a .3 percent higher growth in GDP per capita per year (Gallup 2000, 9). Most important, malaria is curable as well as preventable. Insecticide-treated nets (ITNs), one of the most successful malaria prevention methods, cost from only US$2–$15 per net, and the new lines of artemesinin-based combination therapy (ACT) drugs promoted by many cost $.75–$2.50 per treatment and are quite effective.

However, these costs are still prohibitive for the poorest families (WHO 2005b). In response to these costs and to coordinate activities to help alleviate the suffering caused by malaria, the World Health Organization (WHO) launched the Roll Back Malaria (RBM) initiative in 1998 in partnership with UNICEF, UNDP and the World Bank. This multi-stakeholder initiative set a goal in 2000 to halve the world's malaria burden by the year 2010. This partnership encouraged the world's governments, particularly in countries with endemic malaria, international organizations, non-governmental organizations, private in-

stitutions and business, and the academic and research community to coordinate their efforts, increase funding for antimalarial initiatives, and increase awareness about the costs of this disease.

The RBM initiative consists of the following four key components to reduce the risks and consequences of malaria:

- **Prevention** of malaria through protection against mosquito bites. The prevention strategy includes the promotion, availability, access and utilization of insecticide-treated nets (ITNs). Research has shown in several countries that ITNs can reduce malarial episodes by 50 percent in malaria-endemic communities (Adongo 2005, 366; Chandramohan 2005). As a single intervention, it is estimated that they also prevent 5 percent of all deaths for children under the age of 5. Only breastfeeding and oral re-hydration therapy can save more lives as single interventions, at 13 and 15 percent of deaths, respectively. Because these are prevention and therapy strategies that can be applied at home, they could jointly prevent one-third of all deaths in children under the age of 5 (Jones 2003).
- **Prompt treatment** of malaria through early diagnoses by means of rapid tests and through treatment with antimalarial medicines, such as ACT, within one day of onset of the illness. ACT has been found to be effective for treatment and reduces development of resistance to antimalarial medicines.
- **Protection of pregnant women and their unborn children** through the use of ITNs and intermittent preventative treatment (IPT). The case for ITNs has been made previously, but IPT is also considered a promising approach for preventing malaria during pregnancy. IPT is the use of antimalarial drugs for pregnant women during defined intervals after quickening.[1] Sulfadoxine-pyrimethamine (SP) is the best known and most effective single-dose antimalarial drug, particularly in areas of Africa where malaria is stable and resistance to this drug is low (Jones 2003). It has been associated with the decrease in placental malaria prevalence in several African countries (Rogerson 2000) and is not associated with maternal side effects or perinatal complications (Verhoeff 1998). To ensure women are receiving access to SP, the delivery of the drug is linked to routinely scheduled antenatal clinic visits. WHO presently recommends an optimal schedule of four antenatal clinic visits, with three visits after quickening (WHO 2003a).
- **Pre-empting epidemics** by encouraging and supporting systems that predict malarial outbreaks as well as stop them.

In 2000, in the Abuja Declaration (WHO 2000), African countries committed to the RBM initiative by setting the following targets for Africa for 2010:

- 60 percent of malaria patients have access to appropriate treatment within 24 hours of onset of symptoms
- 60 percent of children and pregnant women are protected from malaria using ITNs
- 60 percent of pregnant women have access to appropriate malaria chemoprophylaxis and IPT

The 2005 World Malaria Report indicates that African countries are still far from achieving these goals, but progress is still being made. This report examines malaria in Ghana and the potential contribution of malaria education to microfinance clients in the achievement of the RBM goals and the Abuja targets.

[1] Quickening is the first motion of the fetus in the womb felt by the mother, occurring usually about the middle of the pregnancy term.

Malaria in Ghana

Malaria is endemic in all of Ghana and affects the country throughout the year. According to a Ghanaian government study, malaria prevalence has been increasing over time due to drug resistance, association between malaria and HIV/AIDS, climate and environmental change and inadequate control strategies (Adams 2004, 29).

Malaria accounts for 44 percent of reported outpatient visits (GHS 2005b, 19) and 17 percent of all mortality cases in Ghana (31); however, the reported cases of malaria are a small percentage of the actual number of people who suffer from malaria during the year, as the majority of people are treated at home and thus go unreported. The number of reported cases has increased from 1.4 million reported cases in 1990 to 3.5 million cases in 2003 (WHO 2005c).

Of the malaria cases reported, almost one-half of them were children under the age of 5. Malaria is the leading cause of death in these children (Adams 2004, 30), as they experience their first malarial episode during the first two years of life when they have inadequate immunity. Adult women have high levels of immunity but experience impaired immunity during pregnancy. Of the total number of pregnant women reporting to health institutions for an illness in 1998, almost 14 percent suffered from malaria, 11 percent were admitted for malaria treatment and almost 10 percent of all deaths of pregnant women were attributed to malaria (Yeboah-Antwi 1998, 1). A study in Ghana in 2003 found that before the age of 5, both male and female children experience more malaria than at any other time in their lives, and between ages 15 and 44, women experience more malaria than males (Adams 2004, 29).

Malaria is also the leading cause of workdays lost due to illness, contributing to more potential income loss than any other disease. According to Okyere and Dzator (1997), three workdays on average are lost per malarial episode by the patient and two workdays by the caretaker. If a child suffers malaria five to eight times per year and the caretaker three to five times per year, the caretaker could potentially lose up to 31 working days during the year due to malaria. For a mother or father providing for the family, this loss of workdays can cause a tremendous financial burden.

Consequently, malaria is costly in terms of time, as well as in terms of family expenditures. In 2003, malaria accounted for 12.4 percent of total patient fees collected at Ghanaian health facilities, ranking second after childbirth. Average user fees for non-complicated malaria admission were approximately US$12 (105,776 cedis) in 2004 whereas cerebral malaria admission cost approximately US$21 (183,367 cedis) (Adams 2004, 32).

Given these costs, the poor in Ghana are hit the hardest by malaria. A study conducted in 2002 by Akazili in northern Ghana found that the cost of malaria care was just 1 percent of the incomes of rich households and 34 percent of the incomes of poor households. Most of the cost comes from time lost to treat malaria: time lost by the patient and the caretaker who often must travel long distances to reach local health facilities, wait at clinics for treatment and lose productivity from work and household chores. Paying the high costs of malaria care from low incomes implies that consumption of other goods and services, such as food and education, are reduced.

Due to the high cost of treatment at clinics, many Ghanaians self-treat at home. Treatment may include home remedies, use of traditional medicine, and/or consultations at pharmacies. Home remedies may include herbs or other concoctions made at home, and traditional medicine includes purchasing

medicinal preparations from a traditional or spiritual healer. They may use leftover prescription drugs or purchase antimalarial drugs over the counter from chemical shops or street vendors. Ghanaians will normally buy what they can afford and often do not purchase the correct dosage (Dzator 2004, 3). A study conducted in Ghana by Abuaku (2004) found that although chloroquine was the most frequently used antimalarial drug, less than 40 percent of home-based chloroquine treatments corresponded with the Ministry of Health (MoH) treatment guidelines, and very few caregivers gave the correct dosage for children under the age of 5.

Current Malaria Health Policy in Ghana

Due to this widespread abuse of chloroquine, malaria parasites are now highly resistant to the drug. As a result, the MoH recently changed its malaria national response policy. The following list (WHO 2005c) depicts those policy changes, which are reflected and shared in Freedom from Hunger's malaria education module:

- Ghana has changed from cholorquine to artesunate-amodiaquine (ASU+AQ) for treatment of uncomplicated malaria.
- Families are discouraged from self-treating. They must go immediately to the clinic for treatment if they suspect they are suffering from malaria. Because of the drug change, the MoH wants to use the health clinics as a means to educate the population on the new drug treatment.
- Children under five with fever should be treated as if a fever were an indicator for malaria. Caretakers should give the child a fever-reducing drug, then bring the child to the clinic for treatment.
- All children under the age of 2 months with a fever should be brought immediately to the clinic for treatment.
- Pregnant women are encouraged to seek IPT during antenatal care visits at least three times during their pregnancy, to be treated with the antimalarial Fansidar/SP which is safe for pregnant women.

In addition, the Ghana Health Service, WHO, UNICEF, the Global Fund, ExxonMobil,[2] Netmark,[3] Freedom from Hunger, and other programs and initiatives have launched ITN and treatment campaigns throughout the country. Many of these programs have focused on awareness campaigns, high-impact media, advocacy pieces, and subsidized ITNs for pregnant women and children under five. The following list illustrates the specifics of a few of these campaigns:

- ExxonMobil Ghana, Ltd., launched an ITN program in 2004 targeting women in the Greater Accra and Kumasi metropolitan areas, resulting in 76,000 vouchers redeemed for ITNs at ExxonMobil fueling stations (WHO 2005c).
- As part of its Measles Vaccination Campaign, the American Red Cross distributed ITNs in Lawra District to every parent who brought his/her child in for a measles vaccination. Bednet distribution was supported as well by the Ghana Rotary, Rotarians Against Malaria, the World Bank, UNICEF, the Centers for Disease Control (CDC) and the Ghana Red Cross (Kearns 2006).
- The Global Fund provided funding to deliver and promote IPT in 20 districts starting in 2004.
- On April 25, 2005, the Ghana Health Service launched a wide-scale ITN voucher program and used high-impact media and advocacy pieces to raise awareness.
- In June of 2005, the Ghana Health Service used funds from the Global Fund

[2] ExxonMobil is a global petrochemical and energy business that has a non-profit foundation arm that funds local projects in the communities in which they are located.

[3] NetMark is a USAID-funded project whose mission is to reduce the burden of malaria in sub-Saharan Africa by increasing the commercial supply of and public demand for insecticide-treated nets.

to purchase 500 bicycles and 200 motor-bikes to facilitate the dissemination of information about malaria (e.g., use of ASU+AQ and mosquito nets [GHS 2005a]).

- Freedom from Hunger launched its malaria education campaign in 2004 with 10 Rural Banks located throughout Ghana, reaching approximately 20,500 clients (with potential to reach 100,000 family and community members).

2.0 FREEDOM FROM HUNGER'S RESPONSE

Freedom from Hunger is an international development organization that works with microfinance service providers around the world to integrate financial services—in the form of small working capital loans to groups of very poor, rural women—with non-financial services such as lifeskills training. This delivery model, called Credit with Education, is being provided by 50 MFIs in 17 countries worldwide, serving more than 460,000 women. The distinctive, innovative feature of Credit with Education is the tight integration of loan officer and education facilitator roles in one field-staff person. The integration minimizes the cost of delivering health lifeskills training and creates the best opportunities for combined outreach to poor clients and support for an MFI's commercial viability.

Microfinance institutions are not normally directly involved in improving the health of their clients, but many have decided to provide financial *and* non-financial services for some obvious and not-so-obvious reasons. First of all, microfinance institutions provide financial services to poor people to help them minimize income shocks and save money for emergencies and large-item purchases. Sickness of a family breadwinner is a huge income shock and creates needs for lump sums of money to pay for medical fees; poor health is therefore one of the greatest risks to a poor person. Poor people are more likely exposed to health risks because their work is often physically demanding and they are the least likely to afford health care when they are ill (Narayan 2000, 10).

Secondly, a healthy client is a client able to work, to generate a larger income, allowing for better loan repayment rates, increased loan sizes and repeat business for the MFI. For the client, improved income and access to information about health can lead to improved nutrition and health for the family (Beguma 2000; MkNelly and Dunford 1998, 1999).

Because malaria is one of the most reported illnesses in the countries where it works, Freedom from Hunger developed a dialogue-based malaria curriculum for its West African MFI partners with a grant from the GlaxoSmithKline Africa Malaria Partnership to respond to the malaria burden. The malaria curriculum seeks to improve prevention, early detection, and appropriate treatment among vulnerable groups, especially pregnant women and children under the age of 5. The malaria module also seeks to stimulate demand for better malaria prevention and treatment services by better-informed consumers of health care information, products and services.

Freedom from Hunger prepared five credit union federations in Bénin, Burkina Faso, Mali and Togo and ten Rural Banks in Ghana to train their field staff to offer malaria education. During village bank meetings where financial services are delivered by the credit union or Rural Bank's field staff, the same field-staff officer facilitates non-formal, dialogue-based learning sessions in which the group members discuss ways to prevent, detect and treat malaria. In addition, the innovative approach links local financial institutions and their clients with National Malaria Control Programs, health professionals, and private-sector suppliers of medicines and ITNs through a variety of distribution systems for antimalarial drugs and ITNs.

The benefits of the integrated service are expected at multiple levels:

- **Client and Community.** Access to education leads women to improved malaria practices. Reduction in malarial

incidence, duration, and mortality are expected through improvement in early detection, treatment and prevention practices. With access to credit and other financial services, such as savings, households have greater economic capacity to purchase ITNs and effective drugs. There is, in turn, increased earning for the client due to reduced incidence of malaria. Informed clients are also likely to share what they learn with their families and their non-client contacts in the local community.

- **Institutional.** MFIs improve client responsiveness by adding value to integrated services with the addition of malaria education. With training, staff capacity in non-formal, dialogue-education techniques, training systems, and facilitation skills is strengthened. MFIs become a platform for linkages with health-oriented organizations. This can lead to more effective coordination for combating malaria.
- **National Malarial Community and Broader Development Community.** The program offers opportunities to learn how to combat malaria through 1) culturally appropriate, dialogue-based community education; 2) financially sustainable integration of health and financial services; and 3) innovative partnerships between financial and health-oriented organizations. The program also builds upon existing programs and reinforces existing messages.

The malaria education approach fits the Roll Back Malaria priority by promoting partnerships committed to the reduction of poverty and the application of cost-effective interventions: early diagnosis and treatment, greater use of ITNs, treatment for pregnant women and broader public awareness of the causes of malaria and how to prevent it. The policies and strategies of the five participating countries are heavily based on the RBM strategic plans. All of the national strategies recognize the importance of getting information and services out to the community and family level, an approach for which Credit with Education provides an innovative vehicle.

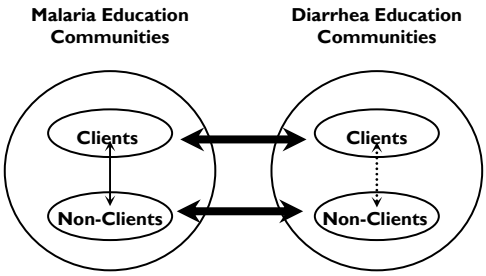
3.0 OBJECTIVES OF THE RESEARCH

In 2004, Freedom from Hunger initiated evaluation research to determine the effectiveness of this education module (10 learning sessions spread over four to six months of biweekly Credit Association meetings) in improving knowledge and promoting behavior change for prevention, detection, and treatment of malaria, with a particular focus on pregnant women and children under the age of 5. The study sought to compare changes among Credit with Education participants and non-participants over a four- to six-month period between baseline and follow-up quantitative studies.[4] The specific groups and their descriptions follow:

- **Malaria Client.** A woman of reproductive age with a child under the age of 6 and who is a member of a Credit Association that receives malaria education as well as financial services.
- **Diarrhea Client.** A woman of reproductive age with a child under the age of 6 and who is a member of a Credit Association that receives diarrhea education as well as financial services.
- **Malaria Non-Client.** A woman of reproductive age with a child under the age of 6 and who is *not* a member of a Credit Association, indicating that this person is neither receiving malaria education nor financial services, but is living in a community where the malaria education is being provided to a Credit Association.
- **Diarrhea Non-Client.** A woman of reproductive age with a child under the age of 6 and who is *not* a member of a Credit Association, indicating that this person is receiving neither diarrhea education nor financial services, but is living in a community where the diarrhea education is being provided to Credit Associations.

The study is designed to allow distinction of the impact of the malaria education from the impact of education in general and to detect the extent of natural knowledge transfer and sharing from clients to non-clients. The design of the study is conceptualized in Figure 1:

Figure 1: Research Design Concept



Among these four primary groups, the evaluation sought to specifically measure the following:

A. Main Knowledge and Practice Indicators
   - Beliefs and practices related specifically to malaria prevention and transmission
   - Early identification and appropriate care of malaria in children up to five years old*
   - Knowledge and use of correct anti-malarial drugs*
   - Knowledge and use of ITNs by vulnerable groups (pregnant women and children up to five years old)*
   - Knowledge and use of IPT by pregnant women*

B. General economic and household information affecting access to appropriate

[4] Due to unforeseen delays in the delivery of the education, the follow-up study took place approximately a year and a half after the baseline. However, the education was still delivered within a four- to six-month period.

* Practice indicators promoted and tracked by the RBM initiative.

preventative measures (including food-security levels, access to sanitation and water sources, and education levels).

Using both baseline and follow-up data, it was hypothesized as follows:

1. At baseline, there would be no statistically significant difference in knowledge and behavior among the four groups; however, it was anticipated that clients could have more correct knowledge and positive behavior than non-clients due to their prior participation in health education sessions that did not address malaria, such as breastfeeding and family planning, as well as due to group solidarity which lends itself to sharing of knowledge and practice among clients.
2. Malaria clients at follow-up would have more correct knowledge and positive behaviors than malaria clients at baseline.
3. Malaria clients would have more correct knowledge and positive behaviors than both diarrhea clients and all non-clients.
4. Malaria non-clients would show more correct knowledge and positive behaviors than diarrhea non-clients due to a spillover effect or transfer of knowledge and behaviors from malaria clients to malaria non-clients (including family members, friends, other community groups, etc.).

4.0 METHODS

The Noguchi Memorial Medical Research Institute at the University of Ghana (located in Legon) conducted both quantitative and qualitative assessments for this impact study. The baseline and follow-up survey research was conducted with two partner Rural Banks in the districts of Afram Plains (Eastern Region) and Asikuma-Odoben-Brakwa (AOB—Central Region) within Credit with Education villages. Within each of those districts, Afram Rural Bank and Brakwa-Breman Rural Bank were chosen by Freedom from Hunger's Ghanaian partner—Freedom from Hunger Ghana—to participate in this study.

Before education services were delivered, communities were randomly assigned to receive either malaria or diarrhea education.

Table 1 indicates which communities in AOB and Afram Plains were randomly selected to receive malaria or diarrhea education. All Credit Association members received education services during a four- to six-month period.

Table 1: Random Assignment of Malaria and Diarrhea Education by Community

Assignment for Brakwa-Breman	
Malaria Education Communities	**Diarrhea Education Communities**
Breman Kokoso	Breman Amanfopong
Breman Bedum	Breman Anwhiam
Breman Fosuansa	Breman Kutanase
Breman Benin	Breman Jamra
Breman Baako	Akim Duakon
Agona Odoben	Breman Nwomaso
Breman Eshiem	Breman Afofosu
Breman Supunso	Breman Ayipey
Breman Towoboase	Breman Fankyenko
Breman Asikuma	Breman Brawka
Assignment for Afram Plains	
Malaria Education Communities	**Diarrhea Education Communities**
Donkorkrom Atakora	Kwame Dwamena
Samanhyia	Kwahu Foso
Donkorkrom Nana Badu	Agortime
Donkorkrom New Asikuma	Odumasua
Donkorkrom Zongo	Adeemmra
Kwaekese	Tease
	Forifori

Qualitative Studies

For the baseline qualitative phase, four communities—two (one rural, one urban) in AOB and two (one rural, one urban) in Afram Plains—were selected to assess differences in practices based on factors such as access to markets and health care facilities and distance from main roads. These studies were to provide a general picture of the types of communities served by the Rural Banks, current knowledge and behavior regarding malaria and the challenges faced, and opportunities available. Focus-group discussions and participatory rapid-appraisal tools (such as community mapping, pair-wise ranking, seasonality calendars and transect walks) were utilized to engage and interview the following stakeholders:

- Health care providers (orthodox and traditional)
- Health volunteers
- Shop owners (especially chemical sellers)
- Community elders and leaders
- Community members
- Women with children under five years of age
- Pregnant women and women who have given birth in the last three months
- Men with wives in the above groups
- Older women

An "interim" follow-up qualitative study was conducted with a Rural Bank that was quite similar to Brakwa-Breman Rural Bank. The additional qualitative study was conducted with Akoti Rural Bank in the district of Abura-Asebu-Kwamankese, which is located just east of AOB. This bank had completed the delivery of the malaria education. The purpose of this interim study was to provide Freedom from Hunger a view into expected results for the upcoming quantitative follow-

up survey. This was not part of the original design but became important because the follow-up quantitative study had to be pushed back approximately six months due to a delay in the delivery of the education by both Afram Rural Bank and Brakwa-Breman Rural Bank.

A follow-up qualitative study was not conducted because there was an error in the sampling of communities for the baseline qualitative. Only one of the baseline qualitative study communities ended up participating in the malaria education; three of the communities were diarrhea education communities. Thus, many of the qualitative references for this study will come from the baseline and the interim qualitative study conducted with Akoti Rural Bank. Although the results from the Akoti study would not be directly related to the communities in the impact study, they provide some insights into certain changes in knowledge and behavior as a result of the malaria education.

Quantitative Surveys

The quantitative component of this evaluation study used a randomized control trial design with randomized program placement at the community level. Malaria education and diarrhea education were randomly assigned to the villages in the program areas of Afram Rural Bank and Brakwa-Breman Rural Bank. The purpose of this design was to allow for measurement of the added benefit of malaria education and to measure spillovers from malaria education clients to community members not participating in credit or education services of the Rural Banks.

Members from the Credit Associations were randomly selected for the survey from lists of Credit Association members. Eligible participants were women of reproductive age (WRA)—ages 15 to 49—with a child under the age of 6. If the selected woman did not meet the criteria, the next woman on the list was selected. For the follow-up survey, the same list used for the baseline survey was used for the sample selection to account for dropouts during the year so that clients who dropped out were not coded as non-clients.

Community members who were not Credit Association members were sampled by dividing the community into four sections. One section was randomly selected through "balloting," and community members were chosen by systematically sampling the houses in that section. The same eligibility criteria were used (WRA with a child under the age of 6). However, if the female head of the household did not meet the criterion, but a daughter or another woman in her household did, she was selected instead of the head female.

In Table 2, sample sizes were set to demonstrate at least a 15 percentage-point change with a *p*-value of 0.05 from baseline to follow-up for the following indicators and their baseline values:[5]

Table 2: Sample Size Determination by Key Indicators

Indicator	Baseline Value
Children ≤5 years sleeping under mosquito nets	9%
Women of reproductive age (WRA) sleeping under mosquito nets	8%
Children ≤5 years sleeping under an ITN	1.4%
WRA sleeping under an ITN	1.4%
Pregnant women sleeping under mosquito nets	9.3%
Pregnant women sleeping under ITNs	3.1%

In the baseline and follow-up studies, approximately 1,000 surveys were conducted, 125 surveys per group (the sample-size target was 800 surveys, 100 per group); however, over-sampling ensured a minimum of 100

[5] These baseline values were taken from various sources such as the 2003 DHS Ghana survey and various Netmark studies conducted in Ghana prior to the Freedom from Hunger study.

accurately completed surveys per group. There was a 20 percent overlap between those interviewed at baseline and follow-up.

Training of Interviewers and Pre-testing of Survey Instrument

In both Afram Plains and AOB, Noguchi Memorial Institute of Medical Research recruited candidate interviewers with at least a high school education and fluency in the local dialect (Ewe, Twi or Fante). Those hired were trained to conduct the survey, to choose the correct respondent, and trained in quality assurance and professional ethics. Interviewers helped translate the surveys into the local language, engaged in role-plays and then tested the surveys in non-study communities. Approximately one-half of the original interviewers at baseline participated in the follow-up survey.

Data Collection and Analysis

The survey data from baseline was entered once, using EpiInfo 6.02, while data-cleaning and verification were performed in SPSS 11.05. The survey data from the follow-up study was entered twice, by two separate teams, into EpiInfo 6.02. Errors were detected and corrected using simple frequencies and crosstabs (to check duplications and omissions). Consistency checks were done, outliers were crosschecked, and minimum and maximum values for all closed-end questions were computed to confirm that none of the values were beyond the required range. Missing values were also crosschecked. Logic checks were performed; descriptive statistics and measures of central tendency were also used to validate the data. When errors were detected, the questionnaire was located and values crosschecked with questionnaire and database. Data was analyzed using SAS, version 9.1, and SPSS, version 11. All analyses are based on cross-tab analysis using Chi-Square statistics and p-values.

Limitations

There are four categories of limitations for this study: education implementation, seasonality, research design, and survey methodology.

In examining **education implementation**, less than 25 percent of all malaria clients indicated they had attended all 10 learning sessions of the malaria education module. Had there been a higher attendance rate, the results might have been more dramatic. When there are financial difficulties for a Credit Association, the field officer will often drop the education until repayment issues are rectified. However, the reliability of this attendance indicator could be reduced by recall error over the four to five months between the completion of the malaria education and the follow-up survey. Moreover, the malaria education was initiated in November and December 2004 and then stopped for approximately nine months before it resumed in September 2005. Sessions one and two were repeated for most groups.

Regarding **seasonality**, research study deadlines combined with unplanned suspension of the education for nine months precluded the possibility of conducting the follow-up at the same time of year as the baseline. The baseline was conducted in August and September of 2004 at the end of the rainy season/beginning of the dry season. The follow-up was conducted in March of 2006 at the end of the dry season/beginning of the rainy season. Both surveys were conducted during generally dry weather, but there were differences in prevalence of fever from baseline to follow-up, related no doubt to greater abundance of mosquitoes at the beginning of the dry season than at the end. Thus, proper comparisons of fever prevalence and treatment-seeking behavior before and after the education cannot be made.

The **research design** called for implementing the education and conducting the research in two different regions of Ghana: Eastern Region and Central Region. At baseline, there were clear regional differences; however, the samples were too small to disaggregate by region the data for malaria clients, malaria non-clients, diarrhea clients and diarrhea non-clients. Therefore, regional differences increased the variance within each group, making statistical detection of differences among the four groups more difficult.

Finally, the actual **survey methodology** inserted some unexpected biases. Malaria and diarrhea clients were interviewed at Credit Association meetings or their places of work, while non-clients were interviewed at their homes. This difference influences results on several levels: a client's level of comfort to answer personal questions near her Credit Association or at her place of work and the inability of the interviewers to verify ownership and the condition of ITNs. The interviewers were also inconsistent in coding the survey instrument to classify whether they observed the condition of the net, so the results are unreliable for this indicator. Moreover, the supervisors did not observe the interviews and did not do a re-sampling verification to measure accuracy (re-interviewing a small subset of women to determine whether they gave the same answers). Finally, there may have been inconsistent use of the antimalaria medicine samples during the interviews; interviewers were supposed to show antimalarial medicine samples to the respondent so that she had a visual prompt for identifying which antimalarials she or her child had taken.

5.0 DISTRICT AND COMMUNITY PROFILES

The malaria and diarrhea education were delivered by field officers of Afram Rural Bank and Brakwa-Breman Rural Bank. Afram Rural Bank is located in Afram Plains District in Eastern Region. Brakwa-Breman Rural Bank is in the Asikuma-Odoben-Brakwa (AOB) District in Central Region. Within the specific program areas in these regions, an analysis of the health landscape at the district level was conducted to gain a greater understanding of the access to medical services and products.

Asikuma-Odoben-Brakwa District is one of the 12 districts in Central Region, and is located in the north-central portion of the region. The district covers a geographical area of 1,577 square kilometers and is one of the least populated districts with a total population of 111,632 in 2000. There are approximately 245 settlements in this district. It has an average growth rate of 2.3 percent and urban growth is estimated at 4 percent per year. Its capital is Breman Asikuma. The three main urban centers of this district are Asikuma, Odoben and Brakwa. AOB had six program communities of less than 1,000 people, six between 1,000 and 5,000 people and four communities of over 5,000 people.

The main occupation in this district is farming. The main cultivated crops are cocoa, palm fruit, maize, cassava, vegetables and rice. Women process large quantities of palm oil to sell.

The AOB district is serviced by one hospital as well as several public and private clinics. Malaria is the most common reason to visit a health facility and leads in morbidity and mortality for the district. For 2003, there were approximately 12,000 reported cases of malaria, with 137 of those cases being severe malaria in children under the age of 5. There were six deaths caused by malaria; four of those were children under the age of 5. Other ailments mentioned in these communities include bilharzia, measles, acute respiratory infection, cough, diarrhea and typhoid fever.

The **Afram Plains District** is located in the northernmost part of the Eastern Region and covers approximately 5,040 square kilometers. It forms a peninsula into Lake Volta. Donkorkrom is the district capital. The total population in 2000 was estimated at 150,000. This district accounts for 6.5 percent of Eastern Region's population. There are four sub-districts and a total of 540 widely scattered communities in the district. It has a growth rate of 1.4 percent. The majority of the district (95 percent) lives in very rural settings. Afram Plains has no program community over the size of 5,000. Two communities have populations between 1,000 and 5,000 and the rest have less than 1,000 people.

Like AOB district, one of the main occupations is farming; however, fishing is also an important economic activity. Food crops include yams, coco-yams, cassava, plantains, vegetables, sweet potatoes, beans and groundnuts. Those living around the Afram River and its tributaries fish and smoke or salt the fish to sell in the market. In addition to processing fish, women are involved in cassava processing.

The Afram Plains District is served by one hospital, three health centers, three health posts and four Community-based Health Planning and Service (CHPS)[6] centers.

[6] The CHPS initiative is a program launched by the Ghana Health Service to transform clinic-based primary health care to community-based health services.

Like AOB, the district's leading disease is malaria, with approximately 9,500 reported cases (estimated in 2003). It is present year-round, but peaks during the rainy season. There were four reported deaths caused by malaria. Other ailments mentioned in these communities include bilharzia, hernia, measles, acute respiratory infection, cough, diarrhea, typhoid fever and rheumatism.

Men and women in both districts tend to have money at the same times of the year. For part of the year, the men (especially those in a community called Anwhiam) acknowledged that they relied on their women to support them, since the women are usually involved in petty trading. Families have more money from November to March when they are harvesting their crops. Afram residents near the river, whose main occupation is fishing, have money from February to March and around June and July. Men invest part of their money in labor to clear their farms and, in the case of the fishermen, in building new canoes. They may also pay debts, contract others to help them build or repair their houses, pay for purchases associated with funerals and pay school fees or hospital bills. Women reported spending on fish, soap, clothes, church dues, and the feeding and care of the children. Women sometimes spend on school fees or hospital bills, pay for items previously purchased on credit (such as cooking utensils) and invest in their trading or farming activities.

A general observation is that the prevalence of malaria increases during the period when family income is at its lowest during the year and workload is increasing (especially for women). This may have implications for mothers making time to seek health care for their children as well as the ability to pay for such care or treatment for malaria.

Access to Health Services

Most program communities had a pharmacy or chemical shop within one mile if not within the community itself. If they did not have a pharmacy in the community, it was five miles or more away.

Most women had to travel more than five miles to a health center, but nine communities out of 31 had one in their community. No community reported having a private clinic, and most had to travel more than five miles to a private clinic. There appeared to be no difference in availability of these health-related services between the two districts and between malaria and diarrhea education communities.

Existence of Other Malaria Initiatives

In both diarrhea and malaria education communities, most residents erroneously reported no malaria initiatives in their community. No doubt the contradiction comes from people not being aware of the various initiatives in their communities, not knowing what to classify as a malaria initiative or not recognizing the malaria education in the Credit Associations as an initiative. In all, AOB residents seemed to recognize more antimalaria activity than Afram Plains residents.

Availability of Antimalarials

Fansidar/SP, the antimalarial drug approved for pregnant women and dispersed by clinics during antenatal appointments, was reported as available in only 7 out of 31 communities. Those seven were distributed fairly evenly among malaria or diarrhea education communities. More communities had chloroquine available and only diarrhea education communities in AOB had local access to ASU+AQ. This has implications for some of the results regarding use of Fansidar/SP and ASU+AQ.

6.0 SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Socioeconomic and demographic characteristics were investigated to detect any significant differences among the four categories of respondents at baseline and prior to program exposure. Based on previous Freedom from Hunger studies, we anticipated that there would be some detectable differences between clients and non-clients, particularly in age, poverty status, and perhaps education levels. Some regional differences were anticipated as well.

The study examined age, level of education attained, religion, and number of household members, including women of reproductive age and pregnant women. To measure socioeconomic status of the household, food security, source of drinking water and type of sanitation were used as proxies for poverty.

Average household size for the entire sample at baseline and follow-up was approximately six people. On average, there were 1.5 women of reproductive age in each household as well as one child under the age of 5. The percentage of women of reproductive age who were actually pregnant at the time of each survey was approximately 6 percent.

The results from both the baseline and follow-up surveys reveal some differences among malaria clients, diarrhea clients, and non-clients in socioeconomic and demographic characteristics. See Tables 3 and 4 for baseline and follow-up data, respectively. Shaded cells indicate significantly different data distribution among the groups. There were no statistically significant differences between baseline and follow-up unless noted in the following text.

Age. In both the baseline and follow-up data, clients were in general older than non-clients. A previous Freedom from Hunger impact study conducted in Ghana also indicated that clients were normally older than non-clients (MkNelly and Dunford 1998). This might be explained by the Credit Association requirement that women participate in an economic activity.

Education Levels. A regional difference appeared between AOB and Afram Plains regarding education levels, reflecting government data on education attainment for Central and Eastern regions. At baseline and follow-up, more respondents in AOB had completed junior or secondary school. However, only 3 to 7 percent completed senior secondary school or higher in both regions. In the Central Region, primary schools and junior secondary schools are usually located less than one and up to ten kilometers from the community. However, senior secondary schools are often boarding schools since students must travel 11 to 15 kilometers to attend. It is less the distance and more the cost of attending these schools that make attendance prohibitive. In the AOB study area, students must travel more than 20 kilometers to the nearest senior secondary school ("Central," "Eastern" 2006).

Drinking Water Sources. More respondents in Afram Plains used public taps than in AOB. In AOB, more homes used piped-in water or open water sources compared to those in the Afram Plains.

There was one surprising difference between malaria clients and malaria non-clients. At baseline, there were no significant differences for water sources. At follow-up, there was an increase for malaria clients from 3.9 to 11.2 percent of respondents having a piped-in/ covered well as a water source. This change was not significant from baseline to follow-up, but at follow-up, malaria non-clients were more statistically likely to use a public

tap and less likely to have piped-in water than malaria clients.

Sanitation Facilities. There were regional differences for sanitation facilities. Afram Plains respondents appeared to use the bush more often and public latrines less than respondents in AOB.

Food Security. Food security is measured by nine questions representing a 9-point scale asking respondents to rate their level of food insecurity based on lack of money to purchase food. This scale has been demonstrated to be an accurate indicator of food insecurity (Melgar-Quiñonez et. al., 2006).

Table 3: Baseline Survey: Socioeconomic and Demographic Characteristics Across All Groups

	Malaria Client (n=260)	Malaria Non-Client (n=267)	Diarrhea Client (n=256)	Diarrhea Non-Client (n=268)	AOB (n=537)	Afram Plains (n=514)	Food-Secure (n=572)	Food-Insecure (n=448)
Age of Respondent								
15–24	6.9	23.2	7.4	27.6	15.1	17.9	17	16.1
25–34	40	50.6	39.4	43.7	40.8	46.3	45.3	41.3
35–44	36.2	19.1	40.6	26.1	32.4	28.2	29	31.5
45–49	16.9	7.1	12.5	2.6	11.7	7.6	8.7	11.2
Highest Level of Education Attained								
No school	18.2	18.9	21	15.4	15.5	21.2	16	21.4
Primary	22.8	21.1	28.1	22.1	20.8	26.3	23.5	24.1
Junior secondary/ Middle	52.9	50.2	47	53.9	56.6	45.3	53	48
Senior secondary/ Vocational	6.2	9.8	4	8.6	7.1	7.3	7.5	6.5
Religion								
Christian	87.9	87.9	91.5	92	92.6	86.9	90.4	89.4
Muslim	12.1	12.1	8.5	8	7.4	13.1	9.6	10.6
Source of Drinking Water								
Piped in/Covered well in yard	3.9	3.8	5.1	4.1	7.6	0.6	1.1	8.3
Public tap/Borehole	85.8	88	66.4	71.3	69.5	86.7	80.6	74.7
Open water source	10.4	8.3	28.5	24.6	22.9	12.7	18.4	17
Sanitation Facilities								
Public latrine	67.6	58.7	54.3	51.3	72.1	43.2	54.8	61.5
Private toilet/Private latrine	29	34.9	30.5	29.6	22.7	39.7	33.3	28.2
Bush	3.5	6.4	15.2	19.1	5.2	17.2	11.9	10.4
Food-Security Level								
Food-secure (non-poor)	54.7	53	59.5	57.4	52.3	59.8	NA	NA
Food-insecure (poor)	45.4	47	40.5	42.6	47.7	40.2	NA	NA
Region								
AOB	51.2	49.1	52.7	51.5	NA	NA	46.9	54.5
Afram Plains	48.9	50.9	47.3	48.5	NA	NA	53.2	45.5

Highlighted cells indicate significant associations ($p<.05$)

There were no statistically significant differences among the four groups for food-security levels. The only significant difference in food security was at the regional level. Respondents in Afram Plains were more likely to be food-secure than those in AOB.

Region. Because significant associations were found between the socioeconomic variables and the regions, the regions were also crossed with the clients and non-clients to determine whether there was a bias when the clients and non-clients were regionally combined. We find that there were no significant differences between the regions and the clients and non-clients. This strengthens the case that the groups were fairly equivalent at baseline and follow-up. The only significant association is between the regions and food security as highlighted.

Table 4: Follow-up Survey: Socioeconomic and Demographic Characteristics Across All Groups

	Malaria Client (n=215)	Malaria Non-Client (n=223)	Diarrhea Client (n=266)	Diarrhea Non-Client (n=242)	AOB (n=505)	Afram Plains (n=441)	Food-Secure (n=554)	Food-Insecure (n=386)
Age of Respondent								
15–24	3.3	29.2	10.5	33.5	17.2	21.3	18.6	19.7
25–34	45.6	45.3	41.7	36.8	39.8	44.9	44.4	38.9
35–44	40	20.2	40.6	27.3	36.2	27.7	30.3	35.2
45–49	11.2	5.4	7.1	2.5	6.7	6.1	6.7	6.2
Highest Level of Education Attained								
No school	19.3	17.2	20.8	19.3	16.1	22.8	19.2	18.9
Primary	25.5	18.1	22.7	22.6	19.3	25.5	20.3	25.4
Junior secondary/ Middle	51.9	58.8	52.7	55.7	60.4	48.3	55.8	53.1
Senior secondary/ Vocational	3.3	5.9	3.8	2.5	4.2	3.4	4.7	2.6
Religion								
Christian	88.6	89.8	96.2	92.2	93.4	90.4	91.3	92.8
Muslim	11.4	10.2	3.8	7.8	6.6	9.7	8.7	7.2
Source of Drinking Water								
Piped in/Covered well in yard	11.2	4.5	1.1	1.2	5	3.4	4.9	3.4
Public tap/Borehole	80.9	92.3	81.5	81.8	79.4	89.3	84.8	82.9
Open water source	7.9	3.2	17.4	16.9	15.7	7.3	10.3	13.7
Sanitation Facilities								
Public latrine	53	54.1	47.9	49.2	63.4	36.4	44	60.4
Private toilet/Private latrine	38.6	36.5	39.3	28.9	29.2	43.4	42	27.2
Bush	8.4	9.5	12.8	21.9	7.3	20.2	14	12.4
Food-Security Level								
Food-secure (non-poor)	64.7	58.1	56.9	46.9	46.1	73.6	NA	NA
Food-insecure (poor)	35.4	41.9	43.1	43.2	53.9	26.4	NA	NA
Region								
AOB	61.5	52.5	52.6	47.9	NA	NA	41.7	70.0
Afram Plains	38.5	47.5	47.4	52.1	NA	NA	58.3	30.1

Highlighted cells indicate significant associations ($p<.05$)

7.0 BASELINE RESULTS

A review of the baseline data demonstrated that there were few significant differences among the comparison groups (such as comparing malaria clients with diarrhea clients). Where there were significant differences, there were no meaningful patterns. Therefore, baseline analysis is not reported here in detail.

There were many significant differences between Afram Plains and AOB. The regional differences were expected, given the regions are different in their socioeconomic status, economic activities, geography, and presence of health facilities and governmental and non-governmental organizations. However, with few exceptions, there were no patterns in the results to indicate one region significantly demonstrated knowledge or positive behaviors over the other region. The exceptions are as follows:

- Afram Plains had significantly higher mosquito net ownership than AOB: 26 percent of respondents owned a mosquito net compared to 6 percent in AOB and 12 percent owned more than one mosquito net compared to 0.7 percent in AOB. These differences were statistically significant.
- Afram Plains had significantly higher net use as well: 18 percent of children under the age of 5 in Afram Plains slept under a mosquito net the night before the survey compared to 4 percent in AOB, and 19 percent of women of reproductive age in Afram Plains slept under a mosquito net the night before the survey compared to 3 percent of AOB women of reproductive age.

These results were not surprising. When Freedom from Hunger Ghana staff were interviewed about these differences, they suggested that respondents in Afram Plains, because of their proximity to Lake Volta, were more likely to use mosquito nets as a way to reduce the annoyance of insects—including mosquitoes.

8.0 FOLLOW-UP RESULTS

Malaria Prevention

Participants in the malaria education were taught that malaria is caused by a parasite that is transmitted from one person to another through the following transmission process:

1. A mosquito bites a person who is infected with malaria. Through the transfer of blood, the mosquito is infected with the malaria parasite.
2. The parasites multiply inside the mosquito and later, after about 10 to 14 days, they are mature and ready to be passed on to somebody else.
3. If the mosquito now bites a healthy person, it transmits the parasite to him or her. The parasite multiplies inside the person and can make him or her sick with malaria after another 10 to 12 days.

Cause of Malaria

At baseline, it was clear from the quantitative and qualitative studies that there was a wide range of explanations as to how one gets malaria. The mosquito was a common response, but so were unclean surroundings, contaminated or cold food, flies, lack of personal hygiene, unbalanced diets, witchcraft, working in the hot sun, or uncovered water storage containers that are breeding grounds for flies and mosquitoes.

When comparing baseline to follow-up statistics (Table 5), it is apparent that respondent knowledge about the connection between malaria and mosquito bites was high and remained high for all four groups. At a minimum, 94 percent of the respondents at baseline and 97 percent of the respondents at follow-up indicated that mosquitoes spread malaria. However, only malaria clients and diarrhea non-clients saw a statistically significant jump in this indicator. When analyzed to focus on those respondents who answered "Only the mosquito," there were significant increases from baseline to follow-up for all groups. This reveals that all groups were likely receiving messages during the time period about how malaria is spread.

When comparing these groups at follow-up (Table 6), malaria clients were statistically significantly more likely to say "Only the mosquito" compared to malaria non-clients, and diarrhea clients were more likely than diarrhea non-clients to say "Only the mosquito."

The qualitative study also showed an obvious jump in knowledge about the role of the mosquito in some villages. When some Credit Associations were asked, "What causes malaria?" their sole answer was "Only the mosquito," even when probed for other answers. However, some Credit Associa-

Table 5: Baseline to Follow-up Comparisons for Malaria Prevention

How is malaria spread?	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Mosquito Bites	94.6	98.1*	95.5	96.9	96.1	97.4	94.0	97.9*
Mosquito Bites Only	38.8	63.0*	27.9	52.5*	26.4	56.3*	26.2	45.6*

*significant at 95% confidence (p<.05)

Table 6: Follow-up Comparisons for Malaria Prevention

How is malaria spread?	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Mosquito Bites								
Mosquito Bites Only	63*	52.5					56.3*	45.6

*significant at 95% confidence (p<.05)

tions continued to indicate that staying in the sun too long or unclean surroundings were causes. It is important to note that although unclean surroundings and open water sources can be breeding grounds for mosquitoes, and thus this answer is not entirely incorrect, the education module emphasized the role of the mosquito. However, observations by the research team during focus-group discussions with the field officers indicate that field officers may have diluted the message about the role of the mosquito by adding components about environment sanitation.

One field agent responded that

". . . [malaria] is caused by the mosquito. So now how do they come by these mosquito bites—if you don't keep your surroundings clean? These are some of the things we taught them, including how mosquitoes bite you and deposit the parasite in your system."

Malaria Transmission

When respondents were asked the details of mosquito transmission, malaria clients had significant jumps from baseline to follow-up (Table 7) in their understanding of the role of the mosquito and the parasite and how the parasite is passed from person to person.

When reviewing the details of the malaria transmission process, malaria clients were the only ones demonstrating a statistically significant increase from baseline to follow-up in those who could state all three steps of the transmission process. Malaria clients were also the only respondents less likely at follow-up to indicate they did not know the answer to the question.

Although the results show that the women understood that malaria transmission starts with a mosquito biting an infected person and then biting an uninfected person, the role of the parasite is less clear. When women were asked to explain the process, the common answer was that

". . . when the mosquito bites you, then you have malaria. After giving it to you, they will give it to another person."

There appears to be a general understanding of the mode of transmission, but not a full understanding of the process as articulated in the learning session. When comparing these groups at follow-up (Table 8), malaria clients were more likely than malaria non-clients and diarrhea clients to state that the process starts with a mosquito

Table 7: Baseline to Follow-up Comparisons for Malaria Transmission

Malaria Transmission Process	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Mosquito bites infected person	83.1	95.8*	86.9	90.1	81.5	87.6	84.7	90.1
Parasite develops in mosquito	3.5	11.3*	2.3	8.5*	3.9	4.9	7.1	8.3
Parasite is transferred to another person who becomes infected	13.5	27.2*	20.6	22.4	16.9	26.6*	15.7	18.2
Other	4.6*	0.0	4.5*	0.0	2.4*	0.0	5.2*	0.4
Don't know	8.1*	1.9	9.0	6.7	13.4	10.1	10.8	6.6
Percentage correctly stating all three steps	0.0	2.4*	0.0	0.5	0.0	1.5	0.4	1.2

*significant at 95% confidence ($p<.05$)

biting an infected person. Malaria clients were also more likely than diarrhea clients to highlight the role of the parasite developing in the mosquito. Diarrhea clients were more likely than diarrhea non-clients to indicate that the parasite is transferred to another person who then becomes infected.

Groups Most Vulnerable to Malaria

At baseline, all four comparison groups demonstrated fairly high knowledge that the two most vulnerable groups are children under the age of 5 and pregnant women. Between 82 and 90 percent of the respondents indicated that CU5 were one of the most vulnerable groups, whereas 50 to 60 percent indicated that pregnant women were among the most vulnerable.

When comparing baseline to follow-up (Table 9), all groups generally had high levels of knowledge that CU5 was one of the most vulnerable groups, yet there were no statistically significant differences among the groups. There was also a relatively high recognition among all groups that pregnant

Table 8: Follow-up Comparisons of Malaria Transmission

Malaria Transmission Process	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Mosquito bites infected person	95.8*	90.1	95.8*	87.6				
Parasite develops in mosquito			11.3*	4.9				
Parasite is transferred to another person who becomes infected							26.6*	18.2
Other								
Don't know	1.9	6.7*	1.9	10.1*				
Percentage correctly stating all three steps								

*significant at 95% confidence (p<.05)

Table 9: Baseline to Follow-up Comparisons for Groups Most Vulnerable to Malaria

Groups Most Vulnerable to Malaria	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Children under age of 5	90.0	87.7	84.3	84.3	87.4	86.6	82.1	82.9
Pregnant women	61.2	68.3	57.7	55.6	58.7	50.8	51.5	58.3
School-aged children (6–14 years)	9.6	15.6*	12.0	13.9	13.0	10.5	19.0	18.8
Women of reproductive age	9.6	6.6	10.1	7.2	10.6	7.1	7.5*	2.1
Adolescent boys	4.6	4.3	6.0	2.7	5.5	2.2	5.6*	1.7
Adult males	10.4*	3.8	7.1	4.9	8.7	6.0	8.6*	3.8
Everyone	11.2	13.7	16.1	20.6	12.2	18.3	22.4	21.3
Don't know	1.5	0.5	2.3	3.1	2.0	1.9	2.2	2.5
Percentage who know vulnerable groups (pregnant women and CU5)	44.2	48.4	40.1	37.7	38.7	39.2	31.3	40.1*

*significant at 95% confidence (p<.05)

Table 10: Follow-up Comparisons for Groups Most Vulnerable to Malaria								
Groups Most Vulnerable to Malaria	**Malaria Client**	**Malaria Non-Client**	**Malaria Client**	**Diarrhea Client**	**Malaria Non-Client**	**Diarrhea Non-Client**	**Diarrhea Client**	**Diarrhea Non-Client**
Children under age of 5								
Pregnant women	68.3*	55.6	68.3*	50.8				
School-aged children (6–14 years)							10.5	18.8*
Women of reproductive age					7.2*	2.1	7.1*	2.1
Adolescent boys								
Adult males								
Everyone								
Don't know								
Percentage who know vulnerable groups (pregnant women and CU5)	48.4*	37.7	48.4*	39.2				
*significant at 95% confidence (p<.05)								

women were among the most vulnerable as well. Malaria clients at follow-up were more likely to indicate that school-aged children were more vulnerable and were less likely to indicate that adult males were the most vulnerable to malaria. Only diarrhea non-clients at follow-up saw a significant increase in the number of respondents who could state both CU5 and pregnant women were vulnerable.

When comparing the groups at follow-up (Table 10), malaria clients were statistically more likely than malaria non-clients and diarrhea clients to indicate that pregnant women were one of the most vulnerable groups. Diarrhea non-clients were more likely than diarrhea clients to indicate school-aged children were most vulnerable, while diarrhea clients were more likely than diarrhea non-clients to indicate that women of reproductive age were more vulnerable. Malaria clients were more likely than malaria non-clients and diarrhea clients to know the two vulnerable groups: pregnant women and CU5.

Best Protection from Malaria: Insecticide-treated Nets

There were four malaria education sessions focusing on the benefits of ITNs and how they are the best way to protect oneself from malaria, how to re-treat nets and how to ensure that everyone has a mosquito net. Knowledge about the benefits of ITNs was relatively high at baseline, 77 to 80 percent of all respondents indicating that ITNs were the best method of protection from malaria.

In addition to mosquito nets, the focus-group discussions revealed that environmental cleanliness was a highly recognized method for preventing malaria. The groups indicated that there were periodic communal labor activities to clean the entire community, such as weeding and removing waste and trash from choked gutters. Some members also emphasized the need for environmental hygiene in the community, indicating that if individuals cleaned their surroundings and took proper care of themselves, then the entire community could be assured of good sanitary conditions that prevent malaria. Community meetings, campaigns and social events were also used to educate people on both the need to ensure

environmental cleanliness and ways to prevent malaria.

Baseline to follow-up comparisons demonstrated a statistically significant increase for all groups regarding recognition of ITNs as the best means of protection against malaria (Table 11). Again, other programs were spreading messages about the utility of ITNs, but the malaria education increased the knowledge gain even more.

When comparing the groups at follow-up, malaria clients were less likely to mention any other protection measures and less likely to indicate they didn't know the answer. They were more likely than malaria non-clients and and diarrhea clients to indicate that ITNs were the best protection measure (Table 12).

It was noted in the focus-group discussions that ITN use might be explained as a result of the nuisance mosquitoes present rather than as protection from malaria. When women were asked how to protect themselves from malaria, mosquito nets were mentioned more often when the question was rephrased from, "What can be done to prevent malaria?" to "What can be done to prevent mosquito bites?"

Ownership of Mosquito Nets

While knowledge about the benefits of using a mosquito net was high, actual use of mosquito nets was relatively low. However, there were some significant jumps for many groups in the ownership of mosquito nets from baseline to follow-up, with malaria clients seeing the biggest jump.

Although all groups saw a statistically significant increase in the number of households owning at least one mosquito net, malaria clients (Table 13) not only saw the greatest increase from baseline to follow-up but also the largest absolute percentage of households that owned at least one mosquito net (51 percent). Only malaria clients and non-clients saw a significant increase in ownership of more than one mosquito net.

Malaria clients saw a signficant increase of households owning at least one ITN; they owned the largest percentage of ITNs at 11 percent. Malaria non-clients and diarrhea

Table 11: Baseline to Follow-up Comparisons for Participants Who Indicated that ITNs were the Best Way to Protect Oneself

Best Protection from Malaria	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Percentage who indicated that ITNs were best protection from malaria	79.1	96.7*	77.4	91.7*	76.9	91.7*	77.2	91.3*

*significant at 95% confidence (p<.05)

Table 12: Follow-up Comparisons for Best Protection from Malaria

Best Protection from Malaria	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Percentage who indicated that ITNs were best protection from malaria	96.7*	91.7	96.7*	91.7				

*significant at 95% confidence (p<.05)

Table 13: Baseline to Follow-up Comparisons for Net Ownership								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
Net Ownership	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Percentage of households possessing at least 1 mosquito net	11.2	50.7*	13.1	35.4*	17.2	42.9*	20.9	46.5*
Percentage of households possessing more than 1 mosquito net	4.2	9.4*	1.5	7.6*	8.6	12.0	9.7	14.9
Percentage of households possessing at least 1 ITN	2.3	11.3*	2.3	9.0*	2.7	5.6	1.5	8.7*
Percentage of households possessing more than 1 ITN	0.8	2.8	0.8	1.8*	0.8	1.1	0.0	2.5*
*indicates is significant at 95% confidence (p<.05)								

Table 14: Follow-up Comparisons for Net Ownership								
Net Ownership	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Percentage of households possessing at least 1 mosquito net	50.7*	35.4			35.4	46.5*		
Percentage of households possessing more than 1 mosquito net					7.6	14.9*		
Percentage of households possessing at least 1 ITN			11.3*	5.6				
Percentage of households possessing more than 1 ITN								
*significant at 95% confidence (p<.05)								

non-clients also had significant increases from baseline to follow-up in the ownership of at least one ITN. For households owning more than one ITN, only malaria non-clients and diarrhea non-clients experienced statistically significant increases.

When comparing these groups at follow-up (Table 14), malaria clients were 30 percent more likely than malaria non-clients to own at least one mosquito net. Malaria clients were 50 percent more likely than diarrhea clients to own at least one ITN. Inexplicably, diarrhea non-clients were more likely than malaria non-clients to own at least one and more than one mosquito net. Credit Association members indicated that, because they are using mosquito nets, they are seeing positive changes.

One woman indicated,

"When my child was not sleeping in the net, mosquitoes bit him a lot. Because of that he did not sleep well. But now he can sleep…. It makes the child strong and we can save money for something else. If they sleep in the net they do not fall sick for me to take them to the hospital. I can use my money for something else."

It is clear from the results in this section that there were other initiatives promoting mosquito nets in these regions. One village elder indicated that as a result of the RBM program,

"Now we realize the importance of mosquito nets in the prevention of malaria. This has also changed our perception on the use of all kinds of herbs. These days, mothers and pregnant women do not die like they used to. Children also do not die anymore since the last three to four years."

The much larger jump in net use by malaria clients suggests that the education is reinforcing knowledge the women already have and the education further motivates them to purchase nets. One Credit Association member summarizes this in her response to the question of whether or not she used a mosquito net before the education:

"We were told about it at weighing [at the clinic] but I never took it serious[ly]."

Reasons for Not Owning a Mosquito Net

Field officers highlighted one potential reason for the low level of net ownership: people do not understand the benefits until they have experienced benefits. They also posited that the lack of availability of nets in some communities significantly hindered the take-up of these nets, and they felt this constrained them as facilitators during the education sessions because they could not provide mosquito nets or make suggestions regarding where women could go to buy one at an affordable price.

In response, Freedom from Hunger Ghana,[7] which provides direct technical assistance to Afram Rural Bank, Brakwa-Breman Rural Bank and Akoti Rural Bank, linked up with net-making organizations in Ghana and provided the nets to the banks for them to sell to the women. This occurred several weeks after the start of the education. However, the nets cost more than $10.00 (85,000 cedis), and none of the women were buying them. Once the MoH started providing the nets in the community at $2.50 (20,000 cedis) approximately one to two months later, the field officers directed the women to the MoH to purchase the cheaper nets.

At follow-up only, respondents were asked to explain their reasons for not owning a mosquito net. For all groups (see Figure 2), approximately 56 percent of respondents indicated that affordability was the main reason, 23 percent indicated availability was the challenge, and 10 percent felt they did not need a mosquito net. Eleven percent indicated that the one they previously owned was damaged and they had not purchased a new one. Women in the focus groups also indicated that the nets trapped too much heat while they slept. Some women, because they were no longer considered a "vulnerable group" (pregnant), felt they no longer needed

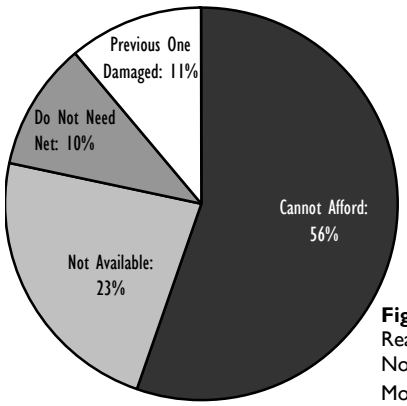


Figure 2: Reasons for Not Owning a Mosquito Net

[7] Freedom from Hunger Ghana is an independent non-governmental organization (NGO) in Accra, Ghana. It is not an extension of Freedom from Hunger; it is, however, an active partner in disseminating non-financial services (mainly education) to 10 Rural Banks in Ghana.

to sleep under a bednet. Other women wanted to buy a net and claimed they would buy a net if they could purchase one on credit. Discussions with the women also indicate that the lack of widespread use of the ITN does not constitute a rejection of the net, but rather indicates that perhaps it is not yet a priority. Perhaps as the women move into the rainy season, when mosquitoes are more of a nuisance and malaria more prevalent, this attitude would change.

Because there is no demand for mosquito nets by community members, shopkeepers do not have an incentive to make them available in their shops. As one chemical shop owner said,

"[The nets] cost a lot, and because they do not have money, they do not buy them . . . people do not ask for it, so I do not feel the need to sell bednets."

There were no significant differences among the four comparison groups in their responses, indicating the reasons for not owning a mosquito net were not significantly affected by the kind of education received, whether they were clients or what region they lived in. However, there was a significant association between the answers and the level of food security; food-secure respondents were more likely to say they did not need a net. The results were then analyzed by actual ownership of mosquito nets by level of food security. Table 15 shows that food-secure respondents were more likely than food-insecure respondents to own at least one or more mosquito nets as well as at least one ITN.

These results might appear contradictory given food-secure respondents were more likely than the food-insecure to indicate they did not need a mosquito net if they did not own one; however, compared to food-insecure clients, they are more likely to actually own a mosquito net. An explanation for this contradiction is that, assuming food security is a proxy for the wealth status of the family, better-off families have screening on their windows and doors, reducing the need for mosquito nets (CIA 2003, 195). For those who do not have screening but use mosquito nets, the food security or wealth status of the family influences whether or not they can purchase a mosquito net.

Table 15: Net Ownership by Food-Security Levels

	Food-Secure	Food-Insecure
Percentage of households possessing at least 1 mosquito net	48.1*	37.8
Percentage of households possessing more than 1 mosquito net	13.4*	8.1
Percentage of households possessing at least 1 ITN	10.1*	6.2
Percentage of households possessing more than 1 ITN	2.5	1.3

*significant at 95% confidence ($p < .05$)

Use of Nets by Children Under the Age of 5

Table 16 indicates that all comparison groups experienced a statistically significant increase in the number of children under the age of 5 under any mosquito net. Malaria clients CU5 experienced the greatest increase at 344 percent. All comparison groups except diarrhea clients experienced a significant increase in the percentage of CU5 under an ITN. This increase was the same for both male children and female children, indicating there was no gender bias. Similar changes were detected with WRA. All four comparison groups experienced a significant increase in the percentage of WRA under any net. Only malaria clients and diarrhea non-clients experienced a significant increase in the percentage of WRA under an ITN.

When comparing the groups at follow-up, malaria clients CU5 were 27 percent more likely than diarrhea clients to sleep under any net and 61 percent more likely to sleep under

Table 16: Baseline to Follow-up Comparisons for Vulnerable Groups Under Nets								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Net Use: CU5 Under Nets								
Under any net	7.3	32.4*	7.7	23.5*	11.8	23.6*	15.9	27.4*
Under ITNs	2.3	7.2*	2.1	5.6*	1.3	2.8	0.4	5.5*
Males	5.7	32.2*	7.8	19.1*	10.3	23.7*	16.7	22.4
Females	9.0	33.3*	7.8	31.0*	12.8	23.4*	15.5	31.5*
Net Use: WRA Under Nets								
Under any net	6.9	26.5*	7.5	19.7*	13.3	21.8*	14.9	24.7*
Under ITNs	1.9	9.1*	2.3	5.4	2.3	2.3	0.4	5.9*
*significant at 95% confidence (p<.05)								

Table 17: Follow-up Comparisons for Vulnerable Groups Under Nets								
	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Net Use: CU5 Under Nets								
Under any net			32.4*	23.6				
Under ITNs			7.2*	2.8				
Males	32.2*	19.1						
Females								
Net Use: WRA Under Nets								
Under any net			26.5*	21.8				
Under ITNs			9.1*	2.3			2.3	5.9*
*significant at 95% confidence (p<.05)								

an ITN (Table 17). Malaria client males CU5 were more likely than non-malaria client males CU5 to sleep under the net.

Much like malaria clients CU5, malaria clients WRA were 18 percent more likely than diarrhea clients WRA to sleep under any net and 75 percent more likely to sleep under an ITN. Diarrhea non-clients WRA were more likely than diarrhea clients WRA to sleep under an ITN.

Treatment of Mosquito Nets

Participants were taught that bednets should be treated with an appropriate insecticide every six months (unless the nets were manufactured as "permanently" treated, in which case treatment lasts for the normal life of the net). Participants practiced re-treating mosquito nets during the education sessions.

Results from Table 18 demonstrate that malaria clients and both diarrhea clients and non-clients saw significant increases in the treatment of mosquito nets from baseline to follow-up.

When comparing the groups at follow-up (Table 19), malaria clients were 60 percent more likely than malaria non-clients and 55 percent more likely than diarrhea clients to have retreated a mosquito net since receiving it. It is clear that the message about re-treating nets made an impression on the malaria clients.

Table 18: Baseline to Follow-up Comparisons for Treatment of Nets								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
Treatment of Nets	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Percentage of households that have treated at least 1 net since receiving the net	3.1	13.2*	2.6	5.4	2.0	6.0*	1.1	8.7*
*significant at 95% confidence (p<.05)								

Table 19: Follow-up Comparisons for Treatment of Nets								
Treatment of Nets	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Percentage of households that have treated at least 1 net since receiving the net	13.2*	5.4	13.2*	6.0				
*significant at 95% confidence (p<.05)								

Acquisition of Mosquito Nets

Except for diarrhea non-clients, the comparison groups experienced a significant increase in the number of households that obtained a net within the last year (Table 20). Malaria clients experienced the greatest increase at 105 percent. There were significant differences between baseline and follow-up in the distribution of types of net owned. It appears that the Dawa net (a pre-soaked mosquito net that can withstand approximately 20 washings) gained exposure and ownership in all groups from baseline to follow-up. When comparing the groups at follow-up (Table 21), there were significant differences between malaria clients and non-clients and between malaria non-clients and diarrhea non-clients; however, the results were not consistent enough to give us a clear picture of why certain groups knew the brand of their mosquito net. In some cases, this could be a recall issue—basically, did people remember the name of their net—because many of the respondents (almost equal to those who stated they had a Dawa net) didn't know the brand of their net.

Almost 100 percent of all mosquito nets were purchased versus being received as a gift; 56 percent of respondents purchased the net themselves and 42 percent of their husbands purchased the net. A small remainder of respondents' mothers, mothers-in-law and other family members purchased the nets. There were no significant differences between the groups regarding who purchased the net (Table 22).

For all respondents with nets, 60 percent of nets were purchased in clinics, 30 percent were purchased at the market and 10 percent were purchased at other locations. Malaria clients were more likely than diarrhea clients to purchase their nets at clinics, and diarrhea clients were more likely than malaria clients to purchase their nets in the market. Likewise, malaria non-clients were more likely than diarrhea non-clients to purchase their nets at the clinic, and diarrhea non-clients were more likely than malaria non-clients to purchase their nets at the market.

Table 20: Baseline to Follow-up Comparisons for Acquisition of Mosquito Nets								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
When Last Net Was Obtained								
<1 year ago	27.6	56.5*	42.9	65.4*	27.3	44.7*	32.1	40.7
Type of Net Owned								
Permanent net (Vestergaard)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pretreated net (Dawa)	17.9	37.4	8.6	50.7	6.8	29.0	1.8	31.3
Pretreated net (KO Net)	3.6	0.9	5.7	1.3	2.3	0.9	1.8	2.7
Pretreated net (Permanet)	17.9	3.7	5.7	7.8	2.3	2.6	3.6	4.5
Other	7.1	0.0	2.9	2.6	4.6	1.8	5.4	6.3
Don't know	53.6	57.9	77.1	37.7	84.1	65.8	87.5	55.4

Highlighted cells indicate significant differences in data distribution for Indicator Groups (p<.05)
*significant at 95% confidence (p<.05)

Table 21: Follow-up Comparisons for Acquisitions of Mosquito Nets								
	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Complications of Malaria During Pregnancy								
<1 year ago					65.4*	40.7		
Type of Mosquito Nets Owned								
Permanent net (Vestergaard)	0.0	0.0			0.0	0.0		
Pretreated net (Dawa)	37.4	50.7			50.7	31.3		
Pretreated net (KO net)	0.9	1.3			1.3	2.7		
Pretreated net (Permanet)	3.7	7.8			7.8	4.5		
Other	0.0	2.6			2.6	6.3		
Don't know	57.9	37.7			37.7	55.4		

Highlighted cells indicate significant differences in data distribution for indicator groups (p<.05)
*significant at 95% confidence (p<.05)

Costs of ITNs

In most cases in Ghana, ITNs are USD 9.00–10.00 (80,000 cedis) unless families have a voucher for nets sold at USD 2.50 (20,000 cedis). For the total program,

- 48 percent of the respondents who owned a mosquito net paid $2.50;
- 9 percent spent $4.00–$5.00; and
- 3 percent spent $9.00–$10.00.

The remaining 40 percent of the respondents had an answer of "Other," so it is difficult to get a clear picture of the actual costs.

Early identification and appropriate care of malaria in children under the age of 5

The most important feature of malaria is fever. Given that 70 to 90 percent of febrile

Table 22: Follow-up Comparisons for Purchase of Nets								
	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Who Purchased the Net?								
Respondent	63.2	57.5	63.2	55.4	57.5	47.8	55.4	47.8
Husband	36.8	40.0	36.8	41.1	40.0	48.7	41.1	48.7
Other	0.9	2.5	0.9	3.6	2.5	3.5	3.6	3.5
Location of Purchase								
Market	17.6	20.3	17.6	33.3*	20.3	45.5*	33.3	45.5
Clinic	72.2	76.0	72.2*	55.9	76.0*	45.5	55.9	45.5
Other	10.2	6.3	10.2	10.8	6.3	9.8	10.8	9.8
*significant at 95% confidence (p<.05)								

children are treated at home (Leach 2005, 36), it is important that caretakers know how to recognize the onset of malaria as well as how to provide or seek correct treatment.

The WHO guidelines indicate that correct treatment for malaria should start within 24 hours of the onset of symptoms to prevent progression from mild to severe malaria or death.

Identification of Fever as Symptom of Malaria

Participants in the malaria education were taught that fever was the most important symptoms of malaria; however, they were also asked to identify other symptoms of malaria. Some symptoms mentioned were shivering, chills, sweating, headaches, joint pain, vomiting, diarrhea and lack of appetite.

The results in Table 23 indicate there were few significant increases from baseline to follow-up in perceived symptoms of malaria in children. There were no differences in the percentage of respondents who recognized fever as the most important symptom of malaria. In all cases, at least 66 percent and a maximum of 72 percent of respondents indicated fever as a symptom. Malaria clients at follow-up were more likely to indicate chills, vomiting and yellowish/dark urine

Table 23: Baseline to Follow-up Comparisons for Perceived Symptoms of Malaria in Children								
Perceived Symptoms of Malaria in Children	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Fever	66.2	70.1	68.2	67.3	70.1	71.3	68.3	67.8
Chills	23.9	41.2*	21.0	31.4	23.6	31.0	19.4	30.6*
Dizziness	7.3	11.4	5.2	7.2	8.7*	3.7	11.9*	5.4
Headache	10.0	11.4	16.1	18.4	14.6*	8.6	14.9*	13.6
Body aches	11.2	12.2	12.4	9.9	8.6	9.0	14.6*	6.6
Vomiting	58.9	73.9*	49.1	65.5	55.5	63.8	60.8	66.5
Yellowish/dark urine	49.2	29.6*	46.8	43.5	50.4	44.8	52.6	47.1
Constipation	2.3	2.8	2.3	3.1	3.9*	0.8	3.7	4.1
Diarrhea	12.7	12.2	15.4	17.5	13.3	18.3	14.6	18.6
Lack of appetite	40.4	52.6*	37.5	43.5	41.7	51.9*	39.2	53.7*
Other	12.7	10.9	15.7	9.9	15.0	11.9	16.0*	7.4
*significant at 95% confidence (<.05)								

Table 24: Perceived Symptoms of Malaria in Children								
Perceived Symptoms of Malaria in Children	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Fever								
Chills	41.2*	31.4	41.2*	31.0				
Dizziness			11.4*	3.7				
Headache	11.4	18.4*						
Body aches								
Vomiting	73.9*	65.5	73.9*	63.8				
Yellowish/dark urine	29.6	43.5*	29.6	44.8*				
Constipation							0.8	4.1*
Diarrhea								
Lack of appetite					43.5	53.7*		
Other								
*significant at 95% confidence (p<.05)								

were signs of malaria. Diarrhea clients were less likely to indicate dizziness, headaches and constipation were symptoms but more likely to indicate lack of appetite as a symptom. Diarrhea non-clients were more likely to indicate chills and lack of appetite were symptoms but less likely to indicate dizziness, headache and body aches as symptoms of malaria in children. When comparing the groups at follow-up, there were no differences between the groups for recognition of fever as the most important symptom of malaria. Malaria clients were more likely than malaria non-clients to identify chills and vomiting as symptoms, but less likely to indicate headaches and yellowish/dark urine as symptoms.

Malaria clients were more likely than diarrhea clients to indicate chills, dizziness and vomiting as symptoms, but less likely to indicate yellowish/dark urine as a symptom. Diarrhea non-clients were more likely than malaria non-clients to indicate lack of appetite was a symptom; diarrhea non-clients were more likely than diarrhea clients to indicate constipation was an important symptom of malaria. Due to the variability among the groups and the statistical differences, it is difficult to draw any conclusions from these results.

Danger Signs of a Seriously Ill Child

Participants were also taught how to identify the symptoms of a seriously ill child so that they could differentiate between mild malaria and severe malaria in order to know when to seek immediate attention instead of initiating treatment at home. The following symptoms of a serious illness were taught: convulsions, unconsciousness, lethargy, vomiting everything and the inability to eat, drink, or breastfeed.

All groups were more likely at follow-up to indicate vomiting was a sign of a seriously ill child. Malaria clients and malaria non-clients were more likely at follow-up to indicate inability to breastfeed, eat or drink, convulsions, dark urine and pallor/yellow eyes as signs of a severely ill child (Table 24).

Diarrhea clients at follow-up were more likely to indicate failure to respond to treatment were signs, but less likely to indicate pallor/yellow eyes as a sign of illness. Diarrhea non-clients were more likely to indicate inability to breastfeed, eat or drink, and failure to respond to treatment, but less likely to indicate pallor/yellow eyes was a sign (Table 25).

Table 25: Baseline to Follow-up Comparisons of Danger Signs of a Seriously Ill Child								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
Danger Signs of a Seriously Ill Child	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Vomits everything	57.3	81.1*	62.2	76.0*	62.6	76.0*	65.3	81.7*
Can't breastfeed/eat/ drink	36.2	58.0*	36.0	49.8*	43.3	51.7	39.6	52.1*
Rapid breathing	6.9	8.0	5.6	9.1	5.9	10.1	8.6	8.3
Lethargy	35.8	31.1	40.8	32.6	42.9	40.1	41.4	34.6
Convulsions	15.0	23.6*	13.9	21.7*	16.1	10.5	14.6	17.5
Dark urine	21.5	29.7*	21.0	27.2	29.1	22.9	28.0	28.3
Pallor/yellow eyes	33.5	22.6*	31.8	24.9	39.0*	29.2	38.8*	30.4
Failure to respond to treatment	2.3	5.2	4.9	4.1	2.0	6.4*	1.9	5.8*
Other	6.9*	1.9	8.6*	0.5	7.1	4.5	7.1*	1.7
Don't know	0.4	0.5	0.0	2.3*	0.8	0.4	1.5	0.0
*significant at 95% confidence (p<.05)								

When comparing the groups at follow-up, there were no significant differences in knowledge about danger signs of a seriously ill child between malaria clients and malaria non-clients (Table 26). Diarrhea clients were more likely than malaria clients to indicate that lethargy was a sign of a seriously ill child, while malaria clients were more likely than diarrhea clients to indicate convulsions were a sign. Malaria non-clients were more likely than diarrhea non-clients to indicate that they did not know any danger signs of a seriously ill child. Diarrhea non-clients were more likely than diarrhea clients to indicate convulsions were a sign. Evidence from the qualitative study indicates that women have a difficult time differentiating between mild malaria and severe malaria (or severe illnesses). In several of the focus group discussions, both Credit Association and community members men-tioned at least three critical danger signs of a severe illness when asked for symptoms of mild malaria.

The danger signs mentioned were convulsions, very high body temperatures, anemia,

Table 26: Follow-up Comparisons for Danger Signs of a Seriously Ill Child								
Danger Signs of a Severely Ill Child	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Vomits everything								
Can't breastfeed/eat/ drink								
Rapid breathing								
Lethargy			31.1	40.1*				
Convulsions			23.6*	10.5			10.5	17.5*
Dark urine								
Pallor/yellow eyes								
Failure to respond to treatment								
Other								
Don't know					2.3*	0.0		
*significant at 95% confidence (p<.05)								

and inability to stand or walk. This indicates that caretakers might not effectively identify early signs of ill health such as a child refusing to play or developing a mild fever as an indication to start malaria treatment. Treatment for malaria therefore might be delayed until danger signs emerge.

Treatment of a Child with Fever

Freedom from Hunger's malaria education sessions in Ghana highlighted that any fever should be treated presumptively as malaria. Before the education started, the proper protocol was to treat your child at home with an antimalarial and if the symptoms did not go away, to take the child to the clinic. The main purpose of this was to empower caretakers to treat their child at home to avoid overcrowding in health facilities as well as to help those families who do not have easy access to formal health care. At the time the education was being delivered, the Ghanaian MoH was moving from chloroquine treatments to artemesinin-amodiaquine (ASU+AQ) as the recommended therapy. Treatment with antimalarials at home was no longer recommended. Instead, caretakers were advised to give the child a fever-reducing drug and then take the child to the nearest health facility for treatment. The purpose of this visit is to educate caretakers regarding the new combination therapies and how to treat their child with malaria. Once a child was treated with an antimalarial, the education seeks to inform participants that even if a child begins to feel better and is not showing any symptoms of malaria, the full drug regime should be completed. This is because caretakers will often use whatever they have at home to treat a sick family member and there is a tendency to give less than the required dosage or to stop treating with antimalarials when the family member shows signs of improvement and the fever has gone down (Adongo 2005, 370). This is one of the causes of bacterial resistance to chloroquine.

To measure the change in this indicator, participants were asked to respond to the statement, "A mother is giving her child malaria drugs as prescribed. On the second day, the child starts to eat and play again. The child no longer feels warm to the touch. The mother can stop giving the child the rest of the malaria treatment. She can save it for the next time." The respondent could answer "yes" or "no."

When comparing the groups between baseline and follow-up, all groups were less likely at follow-up to indicate they should first treat a child with an antimalarial and more likely to indicate they should take their child immediately to the clinic. The greatest decrease and the greatest increase, respectively, were among malaria clients (Table 27).

When comparing the groups at follow-up, there were no significant differences between the groups for treatment of a child with fever, suggesting that there were other campaigns in the area that also contributed to an increase in knowledge about how to treat a child with malaria. However, malaria clients were more likely to indicate the importance of completing a drug regime than malaria non-clients (Table 28).

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Fever in Children

To measure changes in the prevalence of fever, respondents were asked to indicate whether any of their children under the age of 5 had experienced a fever in the two weeks prior to the survey or had a fever at the time of the survey.

When making baseline to follow-up comparisons, all groups experienced a significant decrease in the prevalence of fever in children. Diarrhea non-clients

Table 27: Baseline to Follow-up Comparisons of Treatment of a Child with Fever								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Treatment of a Child with Fever								
Sponge with tepid water	62.7	62.4	66.3	70.7	63.8	63.8	64.2	64.1
Give chloroquine/ antimalarial	31.5*	14.1	34.8*	16.7	33.1*	15.7	35.8*	17.4
Give paracetamol	37.3	39.9	42.7	46.9	40.9	37.7	42.5	45.0
Give fruit juice	6.9*	1.4	6.4	3.6	2.4	3.0	4.9	2.9
Take to nearest health facility immediately	55.8	77.5*	55.8	69.8*	63.4	75.0*	54.9	71.1*
Other	6.5	3.3	4.1	2.7	6.3	4.1	3.4	2.9
Do not know	0.4	0.0	0.4	1.4	0.0	0.4	0.0	0.0
Full Completion of Drug Regime								
Percentage who know to fully complete an antimalarial drug regime	85.2	87.8	79.3	79.7	83.0	84.0	78.2	82.2
*significant at 95% confidence (p<.05)								

Table 28: Follow-up Comparisons for Treatment of a Child with Fever								
Full Completion of Drug Regime	**Malaria Client**	**Malaria Non-Client**	**Malaria Client**	**Diarrhea Client**	**Malaria Non-Client**	**Diarrhea Non-Client**	**Diarrhea Client**	**Diarrhea Non-Client**
Percentage who know to fully complete an antimalarial drug regime	87.8*	79.7						
*significant at 95% confidence (p<.05)								

experienced the greatest decrease at 45 percent. On average, there was a 40-percent decrease in fever prevalence in the two weeks prior to the survey.

When comparing the groups at follow-up (Table 29), there were no significant differences between the groups for prevalence of fever. It is very likely that seasonal differences affected the results. Fever was more prevalent at baseline at the end of the rainy season than at follow-up, at the beginning of the rainy season. We cannot clearly determine that fever prevalence decreased due to the use of mosquito nets or a lower prevalence of malaria. This unfortunate seasonal difference most likely leads to an underestimation of the real changes at follow-up in knowledge and practice, particularly regarding such behaviors as the purchase of mosquito nets, treatment of fever, or use of antimalarials. Because prevalence of malaria is low, families are not prompted to practice new behaviors.

Type of Antimalarials Taken for CU5

As mentioned previously, Ghana changed its drug regime from using chloroquine to using an artemesinin-based combination treatment called artesunate-amodiaquine (ASU+AQ). There are many brand-named antimalarials in

Table 29: Baseline to Follow-up Comparisons of Prevalence of Fever								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
Prevalence of Fever	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Percentage of children with fever in the last two weeks	49.5*	30.9	47.3*	28.4	47.0*	28.3	53.2*	28.8
Percentage of children who had a fever at the time of the survey	32*	13.4	29.7*	14.0	28.8*	13.6	36.1*	14.6
*significant at 95% confidence (p<.05)								

Ghana. There are approximately 36 antimalarial brands available in chemical shops and through health clinics.

Even if the population were educated about which antimalarials to use, the drugs are often unavailable in combination form (the drugs are sold separately, but expected to be consumed as a combination therapy). Given that full coordination in the delivery of the correct drugs to health clinics is lacking and the fear that misuse of the ASU+AQ drugs could lead to additional resistance, participants were encouraged to go to a health clinic if they thought their child had malaria.
The baseline to follow-up comparisons (Table 30) demonstrate that all groups except for diarrhea non-clients reduced the use of choloroquine for CU5 and all groups increased the use of amodiaquine. Malaria clients experienced the greatest increase of amodiaquine. There were no significant differences among the groups for the percentage who took choloroquine the same or next day; the only significant increase in the percentage of participants who took amodiaquine the same or next day was seen with the diarrhea non-clients. When comparing the groups at follow-up, the only significant difference was between diarrhea clients and non-clients.

Protecting Pregnant Women from Malaria

There are three key behaviors that are promoted for protecting a pregnant woman from malaria. These were conveyed in the malaria education sessions:

- ❖ All pregnant women must sleep under an ITN throughout their pregnancy.
- ❖ All pregnant women must take IPT during regular pre-natal visits to a clinic to prevent malaria.

Table 30: Baseline to Follow-up Comparisons of Use of Antimalarials by CU5								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
Use of Antimalarials by CU5	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Percentage who took choloroquine	68.5*	46.7	75.0*	41.7	76.6*	38.9	69.8	58.6
Percentage who took choloroquine same/ next day	67.6	75.0	75.6	84.6	72.9	82.8	69.6	67.4
Percentage who took amodiaquine	3.7	21.7*	4.5	21.7*	6.5	18.1*	5.4	17.1*
Percentage who took amodiaquine same/ next day	75.0	69.2	100.0	76.9	50.0	76.9	28.6	83.3*
*significant at 95% confidence (p<.05)								

Table 31: Baseline to Follow-up Comparisons for Prevention Strategies for Pregnant Women								
Prevention Strategies for Pregnant Women	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Start ANC as soon as pregnant	65.4	81.1*	65.9	78.7*	66.1	82.1*	70.2	83.0*
Sleep under an ITN	43.9	71.7*	44.9	58.4*	48.8	53.0	43.7	53.9*
Take antimalarials as directed	15.4	25.5*	17.2	24.0	21.3	25.8	21.3	24.9
Eat good food/ balanced diet	49.6	32.1*	44.2	36.7	47.6	42.5	42.9	39.4
Treat worm infestation as directed	2.7	0.5	5.6*	1.8	5.5*	0.8	4.5	2.1
Keep surroundings clean	26.9	29.7	27.7	28.1	26.8	20.5	34.7*	24.1
Other	6.5*	1.4	9.7*	2.3	9.5*	3.0	10.8*	2.5
Don't Know	0.4	0.5	1.5	2.3	1.2	1.5	2.6	1.2
Percentage who knew to start ANC and sleep under an ITN	9.6	18.3*	6.7	12.1*	7.8	9.3	6.3	16.1*
*significant at 95% confidence (p<.05)								

- If a pregnant woman gets a fever, she must get treated immediately for malaria.

Comparing baseline to follow-up (Table 31), all groups experienced a significant increase in the percentage of respondents indicating that starting antenatal care (ANC) as soon as pregnant is a prevention strategy. This was a 19 and 24 percent increase. All groups except for diarrhea clients significantly increased in the number of respondents indicating that sleeping under an ITN is a prevention strategy. Malaria clients experienced the greatest increase at 63 percent. Only malaria clients increased from baseline to follow-up in indicating that taking antimalarials as directed is a prevention strategy, as well as eating a balanced diet. Malaria non-clients at follow-up were more likely than at baseline to indicate that treating worm infestations is a prevention strategy. Diarrhea non-clients were less likely at follow-up to indicate that keeping surroundings clean is a prevention strategy.

Comparing the groups at follow-up (Table 32), malaria clients were 19 percent more likely than malaria non-clients, and 26 percent more likely than diarrhea clients to indicate that sleeping under an ITN is a way to protect themselves. Diarrhea clients were 32 percent more likely than malaria clients to say that eating a balanced diet is a malaria prevention strategy, whereas malaria clients were more likely than diarrhea clients to indicate that keeping surroundings clean is a malaria prevention strategy. Overall, malaria clients were 49 percent more likely than diarrhea clients to know that starting ANC and sleeping under an ITN are malaria prevention strategies for pregnant women. Diarrhea non-clients were also more likely than diarrhea clients to state ANC and sleeping under ITNs.

It is clear that the idea of sleeping under an ITN as a way of preventing malaria during pregnancy worked well as a message for malaria clients and for the other groups as well. However, the increases in malaria-client

Table 32: Follow-up Comparisons for Prevention Strategies for Pregnant Women								
Prevention Strategies for Pregnant Women	**Malaria Client**	**Malaria Non-Client**	**Malaria Client**	**Diarrhea Client**	**Malaria Non-Client**	**Diarrhea Non-Client**	**Diarrhea Client**	**Diarrhea Non-Client**
Start ANC as soon as pregnant								
Sleep under an ITN	71.7*	58.4	71.7*	53.0				
Take antimalarials as directed								
Eat good food/balanced diet			32.1	42.5*				
Treat worm infestation as directed								
Keep surroundings clean			29.7*	20.5				
Other								
Don't know								
Percentage who knew to start ANC and sleep under an ITN			18.3*	9.3			9.3	16.1*
*significant at 95% confidence (p<.05)								

knowledge regarding this indicator were much greater than the increases from baseline to follow-up for the other comparison groups.

Complications During Pregnancy

In the malaria education, women were taught about the following possible complications if they were to contract malaria during their pregnancy:

- Anemia, which can lead to a woman bleeding during delivery.
- Increased chances of dying during childbirth.
- Problems for the unborn child—who can be too small and weak and more likely to die in the first year of life.

They were also taught that a pregnant woman could have the malaria parasite in her blood and not show signs of the disease.

During the survey, respondents were asked to list the possible complications of malaria during pregnancy. The results in Table 33 show that from baseline to follow-up, with the exception of miscarriage, malaria clients increased their knowledge in all indicators about complications of malaria during pregnancy. Malaria non-clients significantly increased their knowledge that a pregnant woman could become anemic or could bleed profusely during or after delivery. Diarrhea clients, as well, significantly increased their knowledge that a pregnant woman could bleed profusely during or after delivery, whereas diarrhea non-clients increased their knowledge that a pregnant woman could have a premature or low-birthweight baby. There were no significant differences from baseline to follow-up for respondents who knew that pregnant women could have malaria but not show signs.

Comparing the groups at follow-up (Table 34), with the exception of malaria causing the death of the mother, malaria clients had greater knowledge compared to malaria non-clients in the following indicators: anemia, bleeding during pregnancy, and premature delivery.

Malaria clients were ten times less likely than malaria non-clients and four times less likely

Table 33: Baseline to Follow-up Comparisons for Complications of Malaria During Pregnancy								
Complications of Malaria During Pregnancy	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Cient	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
She could die	50.4	53.8	59.6	63.8	61.0	57.0	64.6	66.0
She could have a miscarriage/abort/ have a stillbirth	64.6*	49.1	59.2	55.7	64.2	57.7	59.7	56.4
She could become anemic	18.9	28.8*	18.4	19.0*	17.7	22.7	19.4	22.4
She could bleed profusely during/after delivery	9.2	42.5*	15.0	28.1*	15.0	23.4*	18.3	21.6
She could have a premature/small-for-date baby	38.5	59.4*	35.2	41.6	33.5	39.3	36.9	46.1*
Other	4.6	3.9	2.6	0.5	4.7	3.4	4.1*	1.2
Don't know	2.3*	0.0	3.4	5.4	4.7	4.2	2.6	5.0
Percentage of women who knew that pregnant women can have malaria but not show signs	55.3	61.5	55.7	46.8	48.0	46.4	51.0	49.2
*significant at 95% confidence (p<.05)								

than diarrhea clients to indicate they did not know the answer to the question. Malaria clients were more likely than diarrhea clients to know that a malaria-infected woman could bleed profusely during delivery and have a premature baby. Diarrhea non-clients were more likely than diarrhea clients to know that a woman could die as a result of malaria during pregnancy.

When asked whether a pregnant woman could have the malaria parasite in her blood but not show signs of malaria, 61.4 percent of malaria clients answered "yes," compared to 46.8 percent of malaria non-clients and 46.4 percent of diarrhea clients.

Use of Intermittent Preventive Treatment (IPT) by Pregnant Women

During the education sessions, women were taught that they should take Fansidar/SP to keep the malaria parasites out of their blood during pregnancy. They must take this drug at least twice and preferably three to four times during their pregnancies. The use of Fansidar/SP significantly increased between baseline and follow-up for all of the groups, indicating that there was widespread promotion of these drugs.

In Table 35, it appears that malaria clients at follow-up were more likely than at baseline to take antimalarials in general during their last pregnancy, and they were also more likely to take Fansidar/SP—a 19 percentage-point jump (or over a 2,000 percent increase). Interestingly, it is evident from the results that the diarrhea clients were in communities where more Fansidar/SP was either available or promoted, given that the increase in its use was much more than that for malaria clients (29 percentage points).

Malaria non-clients and diarrhea non-clients were less likely at follow-up to take chloroquine during their last pregnancy. At

Table 34: Follow-up Comparisons for Complications of Malaria During Pregnancy								
Complications of Malaria During Pregnancy	**Malaria Client**	**Malaria Non-Client**	**Malaria Client**	**Diarrhea Client**	**Malaria Non-Client**	**Diarrhea Non-Client**	**Diarrhea Client**	**Diarrhea Non-Client**
She could die	53.8	63.8*					57.0	66.0*
She could have a miscarriage/abort/have a stillbirth								
She could become anemic	28.8*	19.0						
She could bleed profusely during/after delivery	42.5*	28.1	42.5*	23.4				
She could have a premature/small-for-date baby	59.4*	41.6	59.4*	39.3				
Other	3.8*	0.5						
Don't know	0.0	5.4*	0.0	4.2*				
Percentage of women who knew that pregnant women can have malaria but not show signs	61.5*	46.8	61.5*	46.4				
*significant at 95% confidence (p<.05)								

follow-up, malaria clients were significantly more likely to visit a nurse or midwife for antenatal care than baseline clients; however, the change was small. Malaria clients at follow-up were less likely to seek out a traditional birth attendant than at baseline. There were no significant differences between baseline and follow-up for the respondents who indicated they visited a health professional.

Comparing groups at follow-up (Table 36), diarrhea clients were more likely than malaria clients to take Fansidar/SP, as were diarrhea non-clients compared to malaria non-clients, suggesting that there were other initiatives regarding Fansidar/SP in the communities where the diarrhea education was taking place. Of all four groups, diarrhea non-clients were using more Fansidar/SP. There were no significant differences between the groups at follow-up regarding visits to health professionals for antenatal care. In fact, the education did not necessarily recommend whom a woman should visit, only that she should visit a health care clinic or professional for the Fansidar/SP (as they would be more likely to have the drug than non-professionals).

As with ownership of mosquito nets, a comparison was made between food-secure and food-insecure respondents, as it was hypothesized that wealthier clients would more likely have access to antenatal care services and receive the new drug Fansidar/SP. The results indicate that food-secure respondents were more likely than food-insecure clients to take Fansidar/SP, whereas food-insecure respondents were more likely to take choloroquine and other remedies.

Communication

Throughout the analysis of the data, it has been emphasized that there were several malaria initiatives occurring at the same time as the implementation of Freedom from Hunger's malaria education. Thus to gain a better understanding of the various anti-malarial activities, respondents to the survey

Table 35: Baseline to Follow-up Comparisons for Treatment of Malaria during Pregnancy								
	Malaria Client		Malaria Non-Client		Diarrhea Client		Diarrhea Non-Client	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Antimalarial Drugs Taken During Last Pregnancy								
Fandisar/SP	0.8	19.9*	1.2	27.6*	0.0	28.5*	1.1	38.2*
Chloroquine	58.0	49.8	61.3*	44.9	56.3	51.4	58.8*	47.6
Other	30.0	32.8	31.3	26.5	34.3*	21.7	36.7*	19.6
Antenatal Care Visits								
Health professional/ doctor	18.0	16.8	16.0	13.5	14.9	11.0	13.5	14.6
Nurse/midwife	78.8	80.5	80.5	84.3	79.9	85.2	82.0	81.8
Auxiliary midwife	0.0	1.6	0.0	0.5	0.0	0.4	0.0	0.5
Traditional birth attendant	2.9	0.0	0.4	1.4	2.0	0.4	3.0	2.3
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No one	0.4	1.1	3.1	0.5	3.2	3.0	1.5	0.9
Visit was to a health professional	96.7	99.0	96.5	98.2	94.8	96.6	95.5	96.8
Highlighted cells indicate significant associations (p<.05) *significant at 95% (p<.05)								

Table 36: Follow-up Comparisons for Treatment of Malaria during Pregnancy								
Antimalarial Drugs Taken During Last Pregnancy	**Malaria Client**	**Malaria Non-Client**	**Malaria Client**	**Diarrhea Client**	**Malaria Non-Client**	**Diarrhea Non-Client**	**Diarrhea Client**	**Diarrhea Non-Client**
Fansidar/SP			19.9	28.5*	27.6	38.2*	28.5	38.2*
Chloroquine								
Other			32.8*	21.7				
*significant at 95% confidence (p<.05)								

were asked to specify the sources of messages regarding malaria during the previous year.

Table 37 highlights that, on average, respondents received most messages about malaria through the radio, followed by health staff and Credit Associations, such as the Credit Associations served by the Rural Banks participating in the malaria education.

The great majority of malaria clients indicated they heard malaria messages in Credit Associations, and they were naturally more likely than malaria non-clients and diarrhea clients to have heard messages about malaria in their Credit Association. However, diarrhea clients were also likely—and significantly more likely than diarrhea non-clients—to indicate they heard messages about malaria in the Credit Associations. This result is not surprising, for two reasons.

First, a benefit of participating in Credit Associations is sharing among women about their health and the health of their families; natural sharing of health messages, particularly about malaria given its prevalence, is expected and supported. Second, diarrhea is a symptom of malaria; thus, during discussions about diarrhea, it is likely that conversations among the women in the diarrhea education groups included malaria

Table 37: Where did you hear information on malaria?									
	Average	Malaria Client	Malaria Non-Client	Malaria Client	Diarrhea Client	Malaria Non-Client	Diarrhea Non-Client	Diarrhea Client	Diarrhea Non-Client
Radio	68.3	55.4	73.4*	55.4	69.6*	73.4	73.4	69.6	73.4
Health Staff	47.3	32.4	53.3*	32.4	49.4*	53.3	52.7	49.4	52.7
Credit Associations	24.1	76.5	0.9*	76.5	21.3*	0.9	1.2	21.3*	1.2
Television	21.8	16	35.5*	16	16	35.5	21.2*	16	21.2
Posters	9.9	8.9	10.3	8.9	9.1	10.3	11.2	9.1	11.2
Church	9.4	8	8.4	8	5.3	8.4	16.2*	5.3	16.2*
Women's Groups	8.4	21.6	1.9*	21.6	10.3*	1.9	0.4	10.3*	0.4
Friends	7.7	1.4	12.6*	1.4	6.8*	12.6	10	6.8	10
School	2.1	1.4	4.7*	1.4	0.8	4.7	2.1	0.8	2.1
*significant at 95% confidence (<.050)									

as a possible reason why a child might have diarrhea. If malaria non-clients or diarrhea non-clients indicated they heard messages in a Credit Association, it is possible that the respondents were members of other Credit Associations (not associated with Rural Banks in this study) or women's groups.

Malaria clients were also asked a separate set of questions regarding the sharing of malaria messages with members of their family as well as with other friends or community members. Given the women are encouraged to share messages about malaria, it was important to determine how much sharing was occurring between the clients and others.

The results indicate that approximately 83 percent of the malaria clients said they had shared messages about malaria with family and friends. Messages about malaria being caused by mosquitoes were the most frequently shared, along with messages about ITNs being the best method of protection and about how to treat CU5 with fever.

9.0 DISCUSSION AND CONCLUSIONS

From a programmatic standpoint, the malaria education was a success; there were significant positive increases in many of the indicators for all four comparison groups in this study. The malaria education clients often showed greater marginal increases, indicating that the malaria education complemented the other antimalarial activities in the program communities to increase knowledge and positive behaviors.

In a study conducted by De La Cruz et al. (2006), baseline data from Freedom from Hunger's malaria impact evaluation study was used to determine whether mothers who practice optimal malaria prevention behaviors by having their child sleep under a mosquito net are those with better understanding of the cause, signs and symptoms, and consequences of malaria. The study found that greater knowledge about malaria causation, symptoms and prevention did not necessarily translate into improved health behavior. However, the study suggested as well that it is important to combine culturally based ideas about malaria causation with the medical explanations of the disease for the most optimal acceptance and adoption of positive preventive and treatment behaviors. The results of this baseline to follow-up study seem to support the validity of this suggestion, as Freedom from Hunger's malaria education was designed to take local and cultural understandings into account when discussing malaria with microfinance clients. Malaria clients did show greater marginal improvement in antimalarial behaviors such as increased ownership and net use, as well as treatment of mosquito nets in the last six months.

In other cases, it is apparent that messages need to be more carefully crafted; for example, the messages about fever, the groups most vulnerable to malaria, and symptoms of seriously ill children. Although Freedom from Hunger uses the opportunity of impact evaluations to *prove* the cause-and-effect relationships between our education and expected impacts, this is also an important opportunity to *improve* our education modules and services. Many of the findings have implications for needed revisions to some of the education sessions to strengthen and clarify messages.

The presence of other malaria initiatives in the program areas of interest makes it more difficult to attribute positive increases directly to the provision of credit and malaria education to women in Credit Associations. This welcomed multiplicity of efforts against malaria also highlights the importance of coordination among various program initiatives. It is apparent that these initiatives are beginning to have positive impacts on malaria. The results of this study show that the positive impacts of the other initiatives are substantially enhanced by providing the malaria education for women in Credit Associations. We may speculate with some confidence that the education in absence of the other initiatives would have a substantial impact on malaria, but the circumstances of this study do not allow confirmation.

Rolling Back Malaria?

To determine how effective the "Microfinance Against Malaria" initiative was in contributing to the Roll Back Malaria goals of prevention, prompt treatment and protection, we can compare the results of this study to indicators monitored through the RBM framework.

Prevention. The RBM prevention strategy includes the promotion, availability, access and utilization of ITNs. If the education were evaluated on its ability to improve prevention, the results indicate that the education was quite successful. The increase for malaria clients in net ownership was 352

percent from baseline to follow-up, resulting in approximately 50 percent of the women owning a net, and a 391 percent jump in the ownership of ITNs resulting in 11 percent of the women owning an ITN. In all groups, there were significant increases in CU5 and WRA under any nets and in most cases under ITNs. This indicates that all groups were exposed to messages about the importance of CU5 and WRA (pregnant women) sleeping under nets, particularly ITNs. However, the malaria groups on average responded more than the other groups.

Given that there were seasonal differences between baseline and follow-up, we may actually be underestimating the real impact that could occur when families begin to experience the rainy season. The education was conducted during the dry season; thus, the immediate need for some families to purchase new nets may not occur until the rainy season begins and there is an increase in the prevalence of mosquitoes. Yet, given that interviewers did not observe all nets, we could also be overestimating the number of women who actually owned a net.

If the Abuja target for ITN ownership is 60 percent and malaria clients have 11 percent ITN ownership, there is still a long way to go to achieve this goal; however, the education played a significant role in helping bring this group one step closer to meeting that target.

The study results show it would be desirable to understand better which organizations in the two regions are providing access to nets and to know more about the capacity of the respondents to purchase nets. Almost 50 percent of those who did not own a mosquito net indicated that cost was the most significant impediment. The results also revealed that wealthier respondents—as measured by food-security levels—were more likely to own a mosquito net and an ITN and were more likely to have taken the promoted antenatal antimalarial, Fansidar/ SP.

In addition, most respondents will only buy the net when it is about 2.50 USD (20,000 cedis). Only a few respondents paid the full price. Freedom from Hunger Ghana staff also posited that women from groups who were not members in Plan Ghana communities, not pregnant or did not have children under 5 years of age (which would qualify them for an MoH-subsidized net at 20,000 cedis), would not purchase a net at full price. These women were waiting until they could purchase cheaper nets. Why spend 80,000 cedis when there are those who spend only 20,000? In addition, if the lump sum of 80,000 cedis is a barrier, perhaps having the opportunity to purchase the nets in four payments of 20,000 cedis might improve a family's ability to purchase a net at full cost. However, complaints about cost as the reason for lacking a net could simply mean that ITN ownership is still not a priority for many families.

What becomes clear from this study is that cost and availability of ITNs need to be addressed by developing distribution channels for affordable ITNs.

Prompt Treatment. Prompt treatment involves the recognition of illness as well as treatment within 24 hours of onset of symptoms. The results regarding prompt treatment are difficult to analyze because 1) there was a change in the government's recommended drug regime during the time of the study; and 2) there were no clear data patterns to help determine whether there were clear differences in behavior among the four groups in the evaluation.

The results do give a strong indication that the messages about taking children with fever immediately to the health clinic were effective, as there were significant increases in the number of caretakers indicating that

taking their child immediately to the clinic was the correct protocol for treatment. However, because of seasonal differences, we were unable to detect whether caretakers actually followed through with this protocol. There were no significant differences in the number who sought treatment the same day as the onset of fever or the next day; however, there was less prevalence of fever as well, which makes this measurement difficult and not quite reliable. Even so, the results suggest that the current level of positive treatment-seeking behaviors will help Ghana achieve the Abuja goal of 60 percent of patients having access to appropriate treatment. More than 70 percent of all caretakers indicated they sought treatment for their child with fever within the same or next day, suggesting that children are receiving appropriate treatment from caretakers.

When key messages in the education module are assessed, fever was the most highlighted. Given that there were two full sessions on fever as a symptom of malaria and how to treat fever, it is surprising that there was not a better response or increase in the number of respondents who indicated that fever was a symptom of malaria. When the dataset was analyzed, there were some responses that were coded as "other" that could have been coded as "fever," as the results were symptoms of "warm body," for example. However, the numbers weren't large enough to warrant a recode, because the additional numbers would not have influenced the significance of the figures. Perhaps the way in which people describe "fever" and "malaria" comes into play here. In some instances, the same word is used for fever and malaria; in other cases, there is a malaria fever and then other types of fever. Local terms for malaria and fever should be taken more strongly into account in any revisions of the education module or any other malaria initiatives. Another weakness that becomes apparent through this study is that although fever is taught as the most important symptom of malaria, how one recognizes a fever is not addressed. This should be considered as a possible revision as well.

Protection of pregnant women and their unborn children is achieved through the use of ITNs and preventive medicines. As highlighted previously, messages about ITN use appear to have been quite effective. The number of WRA who slept under ITNs increased significantly for those who participated in the malaria education. This suggests that if a WRA is already sleeping under a mosquito net, she is just as likely to sleep under the net whether or not she recognizes the benefit of protecting herself or of protecting her unborn child when she is pregnant. Yet, 9 percent of WRA sleeping under ITNs is still far from the Abuja goal of 60 percent of vulnerable groups using ITNs. The jump from 2 percent to 9 percent in one year indicates there is movement in the direction of achieving the goal. However, there are only four years left to achieve 60-percent usage of ITNs. A 7 percentage-point jump per year until 2010 will not achieve this goal. Something substantial will need to occur to achieve this goal.

In addition to ITN use by pregnant women, the consumption of Fansidar/SP significantly increased for malaria clients during the time of the initiative. There was a 19 percentage-point jump in malaria clients taking Fansidar/SP during their antenatal visits, resulting in approximately 20 percent of malaria clients taking Fansidar/SP. Food-secure respondents were more likely to have taken Fansidar/SP, indicating that access to this drug may be influenced by the wealth status of the family and this should be taken into consideration when promoting Fansidar/SP for antenatal care visits. Given that this is a relatively new initiative for the Ghana Health Service, that level of coverage in a year is a considerable achievement. With a 20 percentage-point jump in one year,

Ghana will be on track toward achieving 60-percent coverage of pregnant women taking Fansidar/SP during their antenatal care visits.

RÉSUMÉ ANALYTIQUE

Historique

Au Ghana, le paludisme est la principale cause d'absentéisme au travail. Parce que le paludisme peut faire de tels dégâts aux capacités génératrices de revenus de leurs clientes, les institutions de microfinance (IMF) cherchent des moyens de réduire ce risque. Pour répondre à ses IMF partenaires de l'Afrique de l'Ouest, Freedom from Hunger, avec le soutien d'une subvention du « GlaxoSmithKline Africa Malaria Partnership », a développé un programme pédagogique sur le paludisme qui se base sur le dialogue et qui sera intégré aux services financiers des IMF. Afin de déterminer l'efficacité de l'éducation portant sur le paludisme, une évaluation d'impact a été menée auprès de deux banques rurales au Ghana qui ont mis en place une éducation sur le paludisme pour leurs clientes.

Méthodes

Freedom from Hunger a choisi de faire une évaluation RCT ("randomized control trial" ou test de contrôle aléatoire) du module sur le paludisme pour mesurer les changements dans les connaissances, attitudes et comportements liés aux paludisme.

Une enquête de base puis de suivi a été menée entre octobre 2004 et avril 2006. L'éducation sur le paludisme et celle sur la diarrhée ont été attribuées aléatoirement au niveau de la communauté par la Brakwa-Breman Rural Bank dans la région centrale et par l'Afram Rural Bank dans la région de l'est. On trouve dans ces communautés des membres de l'Association de Crédit qui ont reçu une éducation sur le paludisme (les « clientes du paludisme ») ou une éducation sur la diarrhée (les « clientes de la diarrhée »), en plus d'obtenir un accès au crédit. Il y a aussi des membres de la communauté (les non-clientes) qui n'ont pas reçu de crédit ou d'éducation. Le but de cette conception était de permettre une mesure du bienfait supplémentaire de l'éducation sur le paludisme, de prendre en compte les échanges naturels d'information dans un environnement de prêts aux groupes et d'évaluer les « débordements » des clientes du paludisme vers les membres de la communauté qui ne participaient pas au crédit ou à l'éducation. Les personnes interrogées pour l'enquête étaient des femmes en âge de procréer ayant au minimum un enfant âgé de moins de six ans.

Résultats

En plus du programme d'éducation sur le paludisme de Freedom from Hunger, dans les zones du programme, d'autres initiatives touchant au paludisme existaient lors ce cette étude. Ainsi, parmi les nombreux indicateurs et tous les groupes étudiés, nous avons remarqué des améliorations importantes entre l'étude de base et celle de suivi en ce qui concerne les connaissances et les comportements. Cependant, plus d'améliorations successives ont été remarquées chez les clientes du paludisme que chez les clientes de la diarrhée et les non-clientes. Les indicateurs suivants mettent en évidence les domaines où les clientes du paludisme ont excellé par rapport aux autres groupes :

- Les clientes du paludisme avaient plus tendance à reconnaître que les moustiques à eux seuls peuvent causer le paludisme. Par ailleurs, elles comprenaient mieux le rôle du parasite et étaient en mesure de décrire le processus de transmission entier comparé aux autres groupes.
- Les clientes du paludisme avaient plus tendance à savoir que les femmes enceintes et les enfants âgés de moins de cinq ans sont les plus vulnérables par rapport au paludisme.
- Presque cent pour cent des clientes du paludisme à l'enquête de suivi ont indiqué que les moustiquaires imprégnées avec un insecticide (MII) étaient la meilleure protection contre le paludisme.

La moitié des clientes du paludisme possédaient une moustiquaire et onze pour cent possédaient une MII. Les clientes du paludisme avaient plus tendance à posséder une MII.

- Les clientes du paludisme avaient plus tendance à faire dormir sous une MII les femmes en âge de procréer ainsi que les enfants âgés de moins de cinq ans.
- Il y avait deux fois plus de chances que les clientes du paludisme avaient traité à nouveau une moustiquaire dans les six derniers mois.
- Les raisons les plus courantes contre l'utilisation des moustiquaires étaient le manque d'accessibilité et de disponibilité locale.
- Presque quatre-vingt-dix pour cent de toutes les clientes du paludisme ont indiqué qu'elles avaient partagé avec d'autres membres de leur communauté des messages entendus lors de leurs sessions d'éducation sur le paludisme, en particulier ceux portant sur le rôle du moustique dans le paludisme, sur l'utilisation des MII comme étant la meilleure protection contre le paludisme et aussi sur la manière de soigner un enfant qui a de la fièvre.

Conclusions

Du point de vue du programme, l'éducation sur le paludisme a été un succès. Malgré la présence de diverses initiatives touchant au paludisme dans cette zone du programme, les participantes à l'éducation sur le paludisme de Freedom from Hunger ont fait l'expérience d'augmentations marginales plus importantes et de bien meilleurs résultats. Cela indique que l'éducation sur le paludisme a complété les autres activités pour augmenter les connaissances et les comportements positifs. Néanmoins, même les connaissances et comportements accrus ont souvent été ralentis par le manque de capacité dans les familles à avoir accès aux méthodes de prévention promues comme les MII. La microfinance peut ainsi aider une famille à acheter une MII ; cependant, une coordination est nécessaire avec les initiatives actuelles pour augmenter la disponibilité locale des MII mises en vente, en particulier dans les communautés rurales.

RESUMEN EXECUTIVO

Antecedentes

En Ghana, el paludismo es la principal causa de pérdida de días laborales por enfermedad. Las instituciones microfinancieras (IMF), conscientes de que este mal puede afectar en gran medida la capacidad de sus clientes para generar ingresos, están explorando maneras de reducir el riesgo. Con el objetivo de responder a las necesidades de las IMF asociadas a su red en África occidental, Freedom from Hunger desarrolló un programa de educación a través del diálogo sobre el paludismo, con miras a integrarlo a los servicios financieros de las instituciones. El desarrollo del programa fue financiado con una subvención de la Asociación contra el paludismo en África de GlaxoSmithKline. Posteriormente, se llevó a cabo una evaluación de impacto en dos bancos rurales de Ghana que implementaron el programa educativo, para determinar la eficacia del programa educativo sobre esta enfermedad.

Métodos

Freedom from Hunger definió una prueba de control aleatoria para medir los cambios provocados por el programa educativo sobre el paludismo en el conocimiento, las actitudes y los comportamientos relacionados con la enfermedad. Entre octubre de 2004 y abril de 2006 se llevaron a cabo encuestas de base y seguimiento. Los bancos Brakwa-Breman Rural Bank, en la región central y Afram Rural Bank en el este, asignaron aleatoriamente programas educativos sobre diarrea y paludismo a ciertas comunidades. En dichas comunidades algunas socias de los bancos comunales recibieron educación sobre el paludismo ("clientas del programa paludismo") o sobre la diarrea ("clientas del programa diarrea") junto con acceso al préstamo, así como no clientas que no recibieron ni el préstamo ni educación. La encuesta se diseñó de esta forma con los objetivos de medir el beneficio adicional de la educación sobre el paludismo, de tomar en cuenta el intercambio natural de información que se da en un ambiente de crédito grupal y de medir la transferencia de las clientas del programa paludismo hacia los otros miembros de la comunidad que no reciben crédito o educación. El grupo de encuestadas estuvo conformado por mujeres en edad reproductiva con por lo menos un hijo menor de seis años.

Resultados

Además del programa de educación sobre el paludismo de Freedom from Hunger, al momento de hacer el estudio se estaban llevando a cabo otras iniciativas para combatir la enfermedad en las áreas seleccionadas. Es por ello que en muchos indicadores y en todos los grupos estudiados se observó una mejora significativa en cuanto a conocimiento y comportamiento entre el momento de la encuesta base y la de seguimiento. No obstante, las clientas del programa paludismo presentaron una mejora más consistente que aquella observada entre las clientas del programa diarrea y las no clientas. Los siguientes indicadores señalan aquellas áreas en las que las clientas del programa paludismo demostraron un mejor desempeño comparadas con los demás grupos:

- Las clientas del programa paludismo tenían más probabilidad de reconocer que los zancudos por sí mismos pueden ocasionar la enfermedad. Asimismo, tenían más probabilidad de comprender la función del parásito y podían describir todo el proceso de transmisión.
- Las clientas del programa paludismo tenían mayor probabilidad de saber que tanto las mujeres embarazadas como los niños menores de cinco años son más vulnerables a la enfermedad.
- Casi el 100% de las clientas del programa paludismo indicaron en la encuesta de seguimiento que los mosquiteros tratados

con insecticida son la mejor protección contra la enfermedad

- La mitad de las clientas del programa paludismo tenían mosquiteros, 11% de los cuales estaban tratados con insecticida. Las clientas del programa paludismo tenían mayor probabilidad de tener un mosquitero tratado con insecticida
- Las clientas del programa paludismo tenían mayor probabilidad de hacer que las mujeres en edad reproductiva y los niños menores de cinco años de sus hogares durmieran bajo un mosquitero tratado con insecticida.
- Las clientas del programa paludismo tenían el doble de probabilidades de volver a tratar sus mosquiteros con insecticida en un período de por lo menos seis meses.
- Las causas más comunes para no usar mosquiteros fueron el precio y la falta de disponibilidad de los mismos en las localidades.
- Casi 90% de todas las clientas del programa paludismo indicaron que compartían lo aprendido en sus sesiones educativas sobre el paludismo con otros miembros de su comunidad, especialmente en lo relacionado con el papel del mosquito en la enfermedad, el uso de mosquiteros tratados como la mejor forma de protegerse y el tratamiento que debe darse a un niño con fiebre.

Conclusiones

Desde un punto de vista programático, la educación sobre el paludismo fue exitosa. A pesar de la presencia de otras iniciativas relacionadas con la enfermedad en las regiones observadas, las participantes en el programa educativo de Freedom from Hunger obtuvieron mayores incrementos marginales y resultados significativamente superiores. Esto indica que la educación sobre el paludismo complementó las demás actividades para aumentar el conocimiento y los comportamientos positivos de las clientas. Sin embargo, tanto el mayor conocimiento como el cambio de comportamiento son a menudo obstaculizados por brechas en la capacidad de las familias para acceder a los métodos de prevención recomendados, como los mosquiteros tratados con insecticida. Las microfinanzas pueden ayudar a las familias a adquirir estos mosquiteros, aunque es necesario que exista coordinación entre las iniciativas para aumentar la oferta local de mosquiteros tratados, especialmente en las comunidades rurales.

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Appendix

Baseline Survey Instrument—2004

EVALUATION OF THE IMPACT OF MALARIA DIALOGUE EDUCATION IN GHANA
SURVEY QUESTIONNAIRE

INFORMED CONSENT

Hello. My name is _____ and I am working with BREMAN-BRAKWA COMMUNITY BANK. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will help the Bank in its Credit with Education programme. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?
May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED ....1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIEWED ... 2—<END

RECORD | | | | | | | | |

SECTION A. IDENTIFICATION

IDENTIFICATION[1]	
NAME OF COMMUNITY _____ NAME OF RESPONDENT _____ CLUSTER NUMBER..... HOUSEHOLD NUMBER..... REGION CENTRAL ……..01 EASTERN ……..02			

SUMMARY	
RESULT OF INTERVIEW: COMPLETED……...1 UNCOMPLETED…….2	TOTAL PERSONS IN HOUSEHOLD		| TOTAL ELIGIBLE WOMEN (15–49 YRS.)		| LINE NO. OF RESP. TO HOUSEHOLD QUEST.		

Baseline Survey Instrument—2004

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____ DATE _____ ☐☐	☐☐	☐☐

A01. DATE (DAY/MONTH/YEAR) ☐☐ ☐☐ 04	**A07**. REASONS FOR REPLACEMENT: (1) Could not be found (2) Did not wish to answer (3) NA ☐
A02. NAME AND CODE OF INTERVIEWER ☐ _____	**A08.** NUMBER OF CREDIT ASSOCIATION ☐☐ (98) Not Applicable (N/A)
A03. NAME OF COMMUNITY _____	**A09.** How long have you been a member of Credit Association? ☐ Years ☐ Months DON'T KNOW.....98 FOR NON-CLIENTS FILL IN 0 YEARS 0 MONTHS
A04. NAME OF DISTRICT: ☐ (1) Brakwa (2) Afram Plains	**A10.** COMPLETE NAME OF INTERVIEWEE _____ _____ First name Surname name
A05. PERSON SELECTED IS A: ☐ (1) Client (2) Non-client– *Go to A10*	**A11.** Name and Code of Supervisor ☐ _____
A06. WAS SHE SELECTED FROM THE ORIGINAL LIST? (1) Yes – *Go to A08* (2) No ☐ (3) NA	

Baseline Survey Instrument—2004

SECTION B. HOUSEHOLD SCHEDULE

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO RESPONDENT	SEX	RESIDENCE		AGE	WOMEN AGED 15-49	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with respondent	What is the relationship of (NAME) to the respondent?	Is (NAME) male or female? CIRCLE ANSWER	Does (NAME) usually live here? CIRCLE ANSWER	Did (NAME) stay here last night? CIRCLE ANSWER	How old is (NAME)? LESS THAN 1YR= ' 00' DON'T KNOW =98	CIRCLE LINE NUMBER OF ALL WOMEN AGED 15-49 CIRCLE ANSWER	FOR WOMEN AGED 15-49, ASK: Is (NAME) currently pregnant? CIRCLE ANSWER
B01	B02	B03	B04	B05	B06	B07	B08	B09
01		☐☐	M 1 F 2	YES 1 NO 2	YES 1 NO 2	IN YEARS ☐☐	**01**	YES 1 NO/DK 2
02		☐☐	1 2	1 2	1 2	☐☐	**02**	1 2
03		☐☐	1 2	1 2	1 2	☐☐	**03**	1 2
04		☐☐	1 2	1 2	1 2	☐☐	**04**	1 2
05		☐☐	1 2	1 2	1 2	☐☐	**05**	1 2
06		☐☐	1 2	1 2	1 2	☐☐	**06**	1 2
07		☐☐	1 2	1 2	1 2	☐☐	**07**	1 2
08		☐☐	1 2	1 2	1 2	☐☐	**08**	1 2
09		☐☐	1 2	1 2	1 2	☐☐	**09**	1 2
10		☐☐	1 2	1 2	1 2	☐☐	**10**	1 2

* CODES FOR B03 RELATIONSHIP TO RESPONDENT
01 = RESPONDENT
02 = HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = MOTHER/FATHER
07 = MOTHER/FATHER-IN-LAW
08 = BROTHER OR SISTER
10 = OTHER RELATIVE
11 = ADOPTED/FOSTER/STEPCHILD
12 = NOT RELATED
98 = DON'T KNOW

Baseline Survey Instrument—2004

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO RESPONDENT	SEX	RESIDENCE		AGE	WOMEN AGES 15–49	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with respondent.	What is the relationship of (NAME) to the respondent?	Is (NAME) male or female? CIRCLE ANSWER	Does (NAME) usually live here? CIRCLE ANSWER	Did (NAME) stay here last night? CIRCLE ANSWER	How old is (NAME)? LESS THAN 1YR='00' DON'T KNOW =98	CIRCLE LINE NUMBER OF ALL WOMEN AGED 15-49 CIRCLE ANSWER	FOR WOMEN AGED 15-49, ASK: Is (NAME) currently pregnant? CIRCLE ANSWER
B01	B02	B03	B04	B05	B06	B07	B08	B09
			M F	YES NO	YES NO	IN YEARS		YES NO/DK
11		☐☐	1 2	1 2	1 2	☐☐	**11**	1 2
12		☐☐	1 2	1 2	1 2	☐☐	**12**	1 2
13		☐☐	1 2	1 2	1 2	☐☐	**13**	1 2
14		☐☐	1 2	1 2	1 2	☐☐	**14**	1 2
15		☐☐	1 2	1 2	1 2	☐☐	**15**	1 2
16		☐☐	1 2	1 2	1 2	☐☐	**16**	1 2
17		☐☐	1 2	1 2	1 2	☐☐	**17**	1 2
18		☐☐	1 2	1 2	1 2	☐☐	**18**	1 2
19		☐☐	1 2	1 2	1 2	☐☐	**19**	1 2
20		☐☐	1 2	1 2	1 2	☐☐	**20**	1 2

TICK HERE IF CONTINUATION SHEET USED ☐

Just to make sure that I have a complete listing:

1) Are there any other persons such as small children or infants that we have not listed? YES ☐→ ENTER EACH IN TABLE NO ☐

2) In addition, are there any other people who may not be members of your family, such as domestic servants, lodgers or friends who usually live here? YES ☐→ ENTER EACH IN TABLE NO ☐

3) Are there any guests or temporary visitors staying here, or anyone else who slept here last night, who have not been listed? YES ☐→ ENTER EACH IN TABLE NO ☐

Baseline Survey Instrument—2004

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
B10	What is the **MAIN** source of drinking water for members of your household? RECORD ONLY ONE RESPONSE	PIPED WATER PIPED INTO DWELLING ..... 11 PIPED INTO YARD/PLOT ..... 12 PUBLIC TAP ..... 13 WATER FROM OPEN WELL OPEN WELL IN DWELLING ..... 21 OPEN WELL IN YARD/PLOT ..... 22 OPEN PUBLIC WELL ..... 23 WATER FROM COVERED WELL OR BOREHOLE COVERED WELL IN DWELLING ..... 31 COVERED WELL IN YARD/PLOT ..... 32 COVERED PUBLIC WELL ..... 33 BOREHOLE ..... 34 SURFACE WATER SPRING ..... 41 RIVER/STREAM ..... 42 POND/LAKE ..... 43 DAM ..... 44 RAINWATER ..... 51 TANKER/TRUCK WATER ..... 61 BOTTLED WATER ..... 71 SACHET WATER ..... 81 OTHER _____ 96 (SPECIFY)	
B11	What kind of toilet facilities does your household use?	FLUSH TOILET PUBLIC FLUSH TOILET ..... 11 PRIVATE FLUSH TOILET ..... 12 PIT TOILET/LATRINE PUBLIC TRADITIONAL PIT TOILET ..... 21 PRIVATE TRADITIONAL PIT TOILET ..... 22 VENTILATED IMPROVED PIT (VIP) LATRINE PUBLIC (VIP) LATRINE ..... 31 PRIVATE (VIP) LATRINE ..... 32 BUCKET LATRINE ..... 33 NO FACILITY/BUSH/FIELD ..... 41 OTHER _____ 96 (SPECIFY)	
B12	Does your household have any mosquito nets that can be used while sleeping?	YES ..... 1 NO ..... 2 →	Section C
B13	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS ..... ☐	

Baseline Survey Instrument—2004

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES		
B14	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. ASK TO SEE THE BED NET AND INSPECT IT FOR HOLES OR TEARS. **NO HOLES/TEARS = GOOD CONDITION** **VISIBLE HOLES & /OR TEARS = DAMAGED** IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE (S).	NET # 1 OBSERVED GOOD CONDITION.....1 OBSERVED DAMAGED.....2 NOT OBSERVED 3	NET #2 OBSERVED GOOD CONDITION.....1 OBSERVED DAMAGED.....2 NOT OBSERVED.....3	NET #3 OBSERVED GOOD CONDITION.....1 OBSERVED DAMAGED.....2 NOT OBSERVED.....3
B15	How long ago did your household obtain the mosquito net?	< 6 MTHS.....1 6MTH – <1 YR.....2 1 YR - <2 YRS .....3 2–3YRS. .....4 3YRS AND MORE 5	< 6 MTHS.....1 6MTH – <1 YR .....2 1 YR - <2 YRS .....3 2–3YRS.....4 3YRS AND MORE 5	< 6 MTHS.....1 6MTH – <1 YR .....2 1 YR - <2 YRS.....3 2–3YRS. .....4 3YRS AND MORE ...5
B16	OBSERVE OR ASK THE BRAND OF MOSQUITO NET.	PERMANENT' NET[1] VESTERGAARD.....11 (SKIP TO B19) ↵ 'PRETREATED' NET[2] DAWA .....21 KO NET.....22 PERMANET .....23 OTHER .....31 DON'T KNOW.....98	'PERMANENT' NET VESTERGAARD.....11 (SKIP TO B19) ↵ 'PRETREATED' NET DAWA.....21 KO NET .....22 PERMANET .....23 OTHER.....31 DON'T KNOW 98	'PERMANENT' NET VESTERGAARD .... 11 (SKIP TO B19) ↵ 'PRETREATED' NET DAWA.....21 KO NET .....22 PERMANET.....23 OTHER.....31 DON'T KNOW 98
B17	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes?	YES.....1 NO.....2 (SKIP TO B19)↵ DON'T KNOW.....8	YES.....1 NO.....2 (SKIP TO B19) ↵ DON'T KNOW 8	YES .....1 NO .....2 (SKIP TO B19)↵ DON'T KNOW 8
B18	How long ago was the net last soaked or dipped? IF LESS THAN 1 MONTH, RECORD '00'.	MOS AGO ☐☐ MORE THAN 3 YEARS AGO..... 96 DON'T KNOW..... 98	MOS AGO ☐☐ MORE THAN 3 YEARS AGO.....96 DON'T KNOW 98	MOS AGO ☐☐ MORE THAN 3 YEARS AGO ..... 96 DON'T KNOW 98
B19	Did anyone sleep under this mosquito net last night?	YES.....1 NO. .....2 (SKIP TO B21)↵ DON'T KNOW..... .8	YES.....1 NO.....2 (SKIP TO B21)↵ DON'T KNOW 8	YES .....1 NO .....2 (SKIP TO B21)↵ DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES		
		NET #1	NET #2	NET #3
B20	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐	NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐	NAME___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐ NAME___________ LINE NO ☐☐
B21		GO BACK TO B14 FOR NEXT NET; OR, IF NO MORE NETS, END HOUSEHOLD QUESTIONNAIRE AND GO TO SECTION C.	GO BACK TO B14 FOR NEXT NET; OR, IF NO MORE NETS, END HOUSEHOLD QUESTIONNAIRE AND GO TO SECTION C.	GO BACK TO B14 IN THE FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE NETS, END HOUSEHOLD QUESTIONNAIRE AND GO TO SECTION C.
	[1] "Permanent" is a pretreated net that does not require any further treatment. [2] "Pretreated" is a net that has been pretreated, but requires further treatment after 6-12 months.			

TICK HERE IF CONTINUATION SHEET USED ☐

SECTION C. RESPONDENT'S BACKGROUND

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD SIX YEARS OR LESS. (BORN ON NOVEMBER, 1999 OR LATER)

C01	RECORD RESPONDENT'S NAME _____ RECORD RESPONDENT'S LINE NUMBER [ ][ ]		
NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
C02	In what month and year were you born?	MONTH..... [ ][ ] DON'T KNOW MONTH..... 98 YEAR..... [ ][ ][ ][ ] DON'T KNOW YEAR..... 9998	
C03	How old were you at your last birthday? COMPARE AND CORRECT C02 AND/OR C03 IF INCONSISTENT.	AGE IN COMPLETED YEARS [ ][ ] DON'T KNOW =98	
C04	Have you ever attended school?	YES..... 1 NO..... 2	→C07
C05	What is the highest level of school you attended?	PRIMARY.....1 JSS/MIDDLE .....2 SSS/VOCATIONAL/TECHNICAL .....3 HIGHER .....4 ISLAMIC SCH .....5 OTHER _____9 (SPECIFY)	
C06	What is the highest (grade/form/year) you completed at that level?	FORM/CLASS..... [ ][ ] COMPLETED..... 10	
C07	What is your religion?	CHRISTIAN.....1 MUSLIM .....2 AFRICAN TRADITIONAL RELIGION .....3 OTHER _____9 (SPECIFY)	

C08 Now I would like to record the names of all your births in the last six years, whether still alive or not, starting with the most recent one you had.
RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

C09 What name was given to your (most recent/ previous) birth? (NAME)	C10 Were any of these births twins/ triplets?	C11 Is (NAME) a boy or a girl?	C12 In what month and year was (NAME) born? PROBE: What is his/her birthday? DON'T KNOW MONTH =98	C13 Is (NAME) still alive?	C14 IF ALIVE: How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS. Ask for CWC card to confirm age if available IF < 1 YR., RECORD 00	C15 IF ALIVE Is (NAME) living with you?	C16 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD (**FROM B01**) (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD)	C17 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)?
01	SING... 1 MULT.. 2	BOY...1 GIRL..2	MONTH ☐☐ YEAR ☐☐☐☐	YES ..... 1 NO ..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES..... 1 NO 2	LINE NUMBER ☐☐ ↓ (NEXT BIRTH)	
02	SING... 1 MULT.. 2	BOY...1 GIRL..2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO ..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES..... 1 NO 2	LINE NUMBER ☐☐	YES ..... 1 NO ..... 2 IF YES, ADD TO LIST
03	SING... 1 MULT.. 2	BOY...1 GIRL..2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO ..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES..... 1 NO 2	LINE NUMBER ☐☐	YES ..... 1 NO ..... 2 IF YES, ADD TO LIST
04	SING... 1 MULT.. 2	BOY...1 GIRL..2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO ..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES..... 1 NO 2	LINE NUMBER ☐☐	YES ..... 1 NO ..... 2 IF YES, ADD TO LIST
05	SING... 1 MULT.. 2	BOY...1 GIRL..2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO ..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES..... 1 NO 2	LINE NUMBER ☐☐	YES ..... 1 NO ..... 2 IF YES, ADD TO LIST
06	SING... 1 MULT.. 2	BOY...1 GIRL..2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO ..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES..... 1 NO 2	LINE NUMBER ☐☐	YES ..... 1 NO ..... 2 IF YES, ADD TO LIST

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NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
C18	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)?	YES ..... 1 NO 2	
C19	CHECK C14 AND ENTER THE NUMBER OF BIRTHS FROM NOVEMBER 1, 1999[1] OR LATER. IF NONE, RECORD '0'.		☐☐
C20	Are you pregnant now?	YES..... 1 NO ..... 2 DON'T KNOW..... 8	☐ <D01
C21	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS..... ☐☐ DON'T KNOW..... 98	

[1] For fieldwork beginning in 2004, 2005 or 2006, the year should be 1999, 2000 or 2001, respectively.

SECTION Da. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD SIX YEARS OR LESS. (BORN ON NOVEMBER, 1999 OR LATER)

D01	ENTER IN D02 THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask you some questions about your last pregnancy that ended in a live birth.		
D02	FROM QUESTIONS C09 AND C13	LAST BIRTH LINE NUMBER…… ☐☐ NAME _____ LIVING = 1 ☐ DEAD = 2 ☐	
D03	When you were pregnant with (NAME), did you see anyone for antenatal care? IF YES: (1) Whom did you see? (2) Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR ..... 01 NURSE/MIDWIFE..... 02 AUXILIARY MIDWIFE ..... 03 OTHER PERSON TRADITIONAL BIRTH ATTENDANT ..... 04 OTHER _____ 05 (SPECIFY) NO ONE 06	
D04	CHECK D03: ANTENATAL CARE FROM A HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY?	CODE '01', '02', OR '03' CIRCLED (WRITE '1' IN BOX) ☐ CODE '04', '05' OR '06' CIRCLED (WRITE '2' IN BOX) ☐	
D05	During this pregnancy, did you take any drugs in order **to prevent you from getting malaria**?	YES ..... 01 NO ..... 02 DON'T KNOW 08	☐ <D10
D06	Which drugs did you take to prevent malaria? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	FANSIDAR/SP ..... 01 CHLOROQUINE ..... 02 OTHER _____ 03 (SPECIFY) DON'T KNOW 98	
D07	CHECK D06: DRUGS TAKEN FOR MALARIA PREVENTION	CODE "01" CIRCLED (WRITE '1' IN BOX) ☐ CODE "01" NOT CIRCLED (WRITE '2' IN BOX) ☐	→D10
D08	How many times did you take **Fansidar/SP** during this pregnancy?	TIMES ..... ☐☐	

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D09	Did you get the **Fansidar/SP** during an antenatal visit, during another visit to a health facility, or from some other source?	ANTENATAL VISIT.....1 ANOTHER FACILITY VISIT.....2 OTHER SOURCE _____ 6 (SPECIFY)	
D10	CHECK C14 AND C15: ONE OR MORE LIVING CHILDREN BORN FROM NOVEMBER 1, 1999[1] OR LATER ☐ (WRITE '1' IN BOX) NO LIVING CHILDREN BORN FROM NOVEMBER 1, 1999[1] OR LATER ☐ (WRITE '2' IN BOX)		—< E 01

SECTION Db. FEVER/ MALARIA IN CHILDREN

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD SIX YEARS OR LESS. (BORN ON NOVEMBER, 1999 OR LATER)

D11	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD BORN FROM NOVEMBER 1, 1999[1] OR LATER. (IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN FROM NOVEMBER 1, 1999[1] OR LATER, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of all your children **less than 5 years** old. (We will talk about each one separately.)		
D12	NAME AND LINE NUMBER FROM C09 AND C16	YOUNGEST CHILD LINE NUMBER ☐☐ NAME _____	NEXT-TO-YOUNGEST CHILD LINE NUMBER ☐☐ NAME _____
D13	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES .....1 NO .....2 (SKIP TO NEXT-TO-YOUNGEST CHILD) DON'T KNOW 8	YES .....1 NO .....2 (SKIP TO NEXT CHILD) DON'T KNOW 8
D14	Does (NAME) have a fever now?	YES .....1 NO .....2 DON'T KNOW 8	YES .....1 NO .....2 DON'T KNOW 8
D15	Did you seek advice or treatment for (NAME'S) fever?	YES .....1 NO .....2 ..... (SKIP TO D23) =——┘	YES .....1 NO .....2 ..... (SKIP TO D23) =——┘
D16	Where did you **FIRST** go for advice or treatment?[2] IF SOURCE IS HEALTH FACILITY, WRITE THE NAME OF THE PLACE, _____ (NAME OF PLACE)	HEALTH FACILITY HOSPITAL.....01 HEALTH CENTER .....02 COMMUNITY HEALTH OFFICER.....03 HEALTH VOLUNTEER .....04 PRIVATE CLINIC .....05 OTHER SOURCE CHEMICAL SHOP.....06 TBA .....07 HERBALIST/SPIRITUALIST .....08 COMMUNITY- BASED DISTRIBUTORS.....09 DRUG PEDDLER.....10 FRIEND/RELATIVE.....11 OTHER _____ 12 (SPECIFY)	HEALTH FACILITY HOSPITAL ..... 01 HEALTH CENTER..... 02 COMMUNITY HEALTH OFFICER ..... 03 HEALTH VOLUNTEER..... 04 PRIVATE CLINIC..... 05 OTHER SOURCE CHEMICAL SHOP ..... 06 TBA ..... .07 HERBALIST/ SPIRITUALIST..... 08 COMMUNITY- BASED DISTRIBUTORS…… .09 DRUG PEDDLER……..10 FRIEND/RELATIVE ……11 OTHER _____ 12 (SPECIFY)
D17	How long after you noticed (NAME'S) fever did you seek treatment from that person/place?	SAME DAY.....0 NEXT DAY .....1 TWO DAYS AFTER THE FEVER .....2 THREE OR MORE DAYS AFTER THE FEVER.....3 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE OR MORE DAYS AFTER THE FEVER ..... 3 DON'T KNOW..... 8

D18	Who decided that you should go there for (NAME'S) illness? RECORD ALL MENTIONED.	RESPONDENT ..... 1 HUSBAND/PARTNER ..... 2 RESPONDENT'S MOTHER ..... 3 MOTHER-IN-LAW..... 4 FRIENDS/NEIGHBORS..... 5 OTHER _____ 6 (SPECIFY)	RESPONDENT..... 1 HUSBAND/PARTNER..... 2 RESPONDENT'S MOTHER..... 3 MOTHER-IN-LAW ..... 4 FRIENDS/NEIGHBORS ..... 5 OTHER _____ 6 (SPECIFY)
D19	Did you go anywhere else for advice or treatment for (NAME'S) fever?	YES..... 1 NO..... 2 (SKIP TO D23) ↵	YES 1 NO 2 (SKIP TO D23) =——————┘
D20	Where did you go **NEXT** for advice or treatment?[2] IF SOURCE IS HEALTH FACILITY, WRITE THE NAME OF THE PLACE, _____ (NAME OF PLACE)	HEALTH FACILITY HOSPITAL .....01 HEALTH CENTER.....02 COMMUNITY HEALTH OFFICER .....03 HEALTH VOLUNTEER.....04 PRIVATE CLINIC.....05 OTHER SOURCE CHEMICAL SHOP .....06 TBA..... 07 HERBALIST/SPIRITUALIST..... 08 COMMUNITY- BASED DISTRIBUTORS .....09 DRUG PEDDLER ..... 10 FRIEND/RELATIVE ..... 11 OTHER _____ 12 (SPECIFY)	HEALTH FACILITY HOSPITAL..... 01 HEALTH CENTER ..... 02 COMMUNITY HEALTH OFFICER..... 03 HEALTH VOLUNTEER ..... 04 PRIVATE CLINIC ..... 05 OTHER SOURCE CHEMICAL SHOP..... 06 TBA..... .07 HERBALIST/SPIRITUALIST ..... 08 COMMUNITY- BASED DISTRIBUTORS……09 DRUG PEDDLER……..10 FRIEND/RELATIVE ……..11 OTHER_____ 12 SPECIFY))
D21	How long after you noticed (NAME'S) fever did you seek treatment from that person/place?	SAME DAY ..... 0 NEXT DAY..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE OR MORE DAYS AFTER THE FEVER..... 3 DON'T KNOW..... 8	SAME DAY..... 0 NEXT DAY..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE OR MORE DAYS AFTER THE FEVER..... 3 DON'T KNOW 8

D22	Was (NAME) treated with any medicine(s) before going to the health facility?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES..... 1 NO ..... 2 DON'T KNOW..... 8
D23	Was (NAME) treated with any medicine(s)?	YES ..... 1 NO ..... .2 DON'T KNOW 8	YES..... 1 NO ..... 2 DON'T KNOW..... 8
D24	**Which medicines were given to (NAME) for his/her fever?[2]** CIRCLE ALL MEDICINES THAT WERE GIVEN. IF MOTHER IS UNABLE TO RECALL DRUG NAME(S), ASK HER TO SHOW THE DRUG (S) TO YOU. IF SHE IS UNABLE TO SHOW THEM, SHOW HER TYPICAL ANTIMALARIALS AND HAVE HER IDENTIFY WHICH WERE GIVEN. FOR EACH ANTIMALARIAL MEDICINE ASK: **How long after the fever started did (NAME) start taking the medicine?** CIRCLE THE APPROPRIATE CODE. CODES: SAME DAY = 0 NEXT DAY = 1 TWO DAYS AFTER THE FEVER = 2 THREE OR MORE DAYS AFTER THE FEVER = 3 DON'T KNOW = 8	**ANTIMALARIAL DRUGS** A. CHLOROQUINE ..... 0 1 2 3 8 B. FANSIDAR .....0 1 2 3 8 C. AMODIAQUINE .....0 1 2 3 8 D. QUININE .....0 1 2 3 8 **OTHER DRUGS** E. ASPIRIN F. PANADOL G.PARACETAMOL H. CO-TRIMOXAZOLE X. OTHER _____ *(SPECIFY)* Z. UNKNOWN DRUG	**ANTIMALARIAL DRUGS** A. CHLOROQUINE ..... 0 1 2 3 8 B. FANSIDAR .....0 1 2 3 8 C. AMODIAQUINE .....0 1 2 3 8 D. QUININE .....0 1 2 3 8 **OTHER DRUGS** E. ASPIRIN F. PANADOL G.PARACETAMOL H. CO-TRIMOXAZOLE X. OTHER _____ *(SPECIFY)* Z. UNKNOWN DRUG
D25	Did (NAME) get any injection or suppository for the (fever/convulsions)? RECORD ALL MENTIONED.	INJECTION ONLY.....1 SUPPOSITORY ONLY.....2 BOTH .....3 NEITHER.....4 DON'T KNOW 8	INJECTION ONLY.....1 SUPPOSITORY ONLY.....2 BOTH .....3 NEITHER.....4 DON'T KNOW..... 8

[1] For fieldwork beginning in 2004, 2005 or 2006, the year should be 1999, 2000 or 2001, respectively.
[2] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.

TICK HERE IF CONTINUATION SHEET USED ☐

Baseline Survey Instrument—2004

SECTION E. KNOWLDEGE ABOUT MALARIA

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD FIVE YEARS OR LESS. (BORN ON NOVEMBER, 1999 OR LATER)

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E01	What causes malaria? RECORD ALL MENTIONED. Anything else? RECORD ALL MENTIONED.	MOSQUITO BITES ..... 1 SPIRITUAL (superstitious belief). ..... 2 STAYING IN THE SUN FOR TOO LONG ..... 3 WORKING CLOSE TO FIRE FOR LONG PERIODS ..... 4 OVERWORKING YOURSELF ..... 5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E02	Describe the way in which one gets malaria – how is it transmitted? RECORD ALL MENTIONED	MOSQUITO BITES INFECTED MAN ..... 1 PARASITE DEVELOPS IN MOSQUITO ..... 2 MATURE PARASITE IS TRANSFERRED TO MAN WHO BECOMES INFECTED ..... 3 OTHER _____ 4 (SPECIFY) OTHER _____ 5 (SPECIFY) DON'T KNOW 8	
E03	How does one protect himself from getting malaria? RECORD ALL MENTIONED.	BY SLEEPING UNDER ITN ..... 1 BY WEARING CLOTHING TO COVER THE BODY ..... 2 BY CLEARING BUSHES AROUND SURROUNDING ..... 3 BY DISTURBING MOSQUITO HIDING PLACES IN YOUR ROOM ..... 4 MOSQUITO COILS ..... 5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E04	State the best way to prevent malaria. RECORD ONLY ONE RESPONSE	BY USING AN IMPREGNATED BED NET ..... 1 OTHER _____ 2 (SPECIFY) DON'T KNOW 8	

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NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E05	How do you know that a child has malaria? RECORD ALL MENTIONED.	FEVER ..... 11 CHILLS ..... 12 VOMITS ..... 21 LACK OF APPETITE ..... 22 DIZZINESS ..... 31 HEADACHE ..... 32 PAIN IN JOINTS, BONES, ETC ..... 33 CONSTIPATION ..... 41 DIARRHOEA ..... 42 YELLOWISH/DARK URINE ..... 43 OTHER _____ 51 (SPECIFY) OTHER _____ 61 (SPECIFY) DON'T KNOW 98	
E06	Which groups of people are the most vulnerable to the effects of malaria within this community? RECORD ALL MENTIONED.	YOUNG CHILDREN (BELOW 5YRS ..... 1 SCHOOL AGED CHILDREN (6-14 YRS) ..... 2 PREGNANT WOMEN ..... 3 WOMEN OF CHILD BEARING AGE (15-49 YRS) ..... 4 ADOLESCENT BOYS (15-18 YRS) ..... 5 ADULT MALES (ABOVE 18 YRS) ..... 6 EVERYONE ..... 7 DON'T KNOW 8	
E07	What are the signs that tell you that a child is seriously ill – with severe malaria or some other severe illness? RECORD ALL MENTIONED. PROBE FOR RESPONSES.	VOMITS EVERYTHING/REPEATED VOMITING ..... 11 CAN'T BREASTFEED/EAT/DRINK ..... 12 DIFFICULTY IN BREATHING / RAPID BREATHING ..... 21 LETHARGY/SEVERE WEAKNESS ..... 22 CONVULSIONS ..... 23 DARK COLOURED/COCA COLA URINE ..... 31 EXTREME PALLOR/YELLOW EYES ..... 32 FAILURE TO RESPOND TO INITIAL TREATMENT ..... 41 OTHER _____ 51 (SPECIFY) OTHER _____ 61 (SPECIFY) DON'T KNOW 98	

Baseline Survey Instrument—2004

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E08	If a child less than 5yrs old has a fever what should his mother/caretaker do? RECORD ALL MENTIONED.	SPONGE WITH TEPID WATER ..... 1 GIVE CHLOROQUINE ..... 2 GIVE PARACETAMOL ..... 3 GIVE FRUIT JUICE ..... 4 TAKE TO NEAREST HEALTH FACILITY IMMEDIATELY ... 5 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	
E09	I'm going to read a statement. Tell me if you agree with it or not. 'A mother is giving her child with malaria drugs as prescribed. On the second day, the child starts to eat and play again. The child no longer feels warm to touch. The mother can stop giving the child the rest of the malaria treatment. She can save it for next time.'	AGREE ..... 1 DON'T AGREE ..... 2 DON'T KNOW 8	
E10	What could happen to a pregnant woman who gets malaria? RECORD ALL MENTIONED.	SHE COULD DIE ..... 1 HAVE A MISCARRIAGE/ABORT/HAVE A STILL BIRTH ..... 2 SHE COULD BECOME ANAEMIC ..... 3 SHE COULD BLEED PROFUSELY DURING/AFTER DELIVERY ..... 4 SHE COULD HAVE PREMATURE/SMALL FOR DATE BABY ..... 5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY) DON'T KNOW 8	

Baseline Survey Instrument—2004

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E11	What should a pregnant woman do to protect herself from malaria? RECORD ALL MENTIONED. PROBE FOR RESPONSES	START ANC AS SOON AS PREGNANT ..... 1 SLEEP UNDER INSECTICIDE TREATED NETS ..... 2 TAKE ANTIMALARIALS AS DIRECTED ..... 3 EAT GOOD FOOD/BALANCED DIET ..... 4 TREAT WORM INFESTATION AS DIRECTED ..... 5 KEEP SURROUNDINGS CLEAN ..... 6 OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E12	Can a pregnant woman have malaria and not show signs or not know?	YES ..... 1 NO ..... 2 DON'T KNOW 8	

Baseline Survey Instrument—2004

SECTION F. FOOD SECURITY

Now I will ask you questions about the food eaten in your household in the last 12 months, in other words, from October of last year until now.

F1. I will read 4 choices for your response. Please tell me, which of the following best describes the food consumed in your household?

1) Always ate enough of what I wanted
2) I had enough food but not always the kinds I wanted
3) Sometimes I did not have enough food
4) Often I did not have enough food

☐

F2. Please tell me if during the last 12 months, that is from last October until now, you were worried that your food would run out before you had money to buy more.

1) Yes
2) No –*Go to F3*

☐

F2a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

☐

F3. Please tell me if during the last 12 months, that is from last October until now, the food you had was not enough and you did not have enough money to buy more.

1) Yes
2) No – *Go to F4*

☐

F3a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

☐

F4. Please tell me if during the last 12 months, that is from last October until now, you had to eat the same foods daily because you did not have money to buy other foods.

1) Yes
2) No- *Go to F5*

☐

F4a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F5. Please tell me if during the last 12 months, that is from last October until now, you served yourself or any other adult in your household less food because you did not have enough money to buy food.

1) Yes
2) No – *Go to F6* ☐

F5a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F6. Please tell me if during the last 12 months that is from last October until now, you skipped any meals (breakfast, lunch or supper) because you did not have enough money for food.

1) Yes
2) No –*Go to F7* ☐

F6a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F7. Please tell me if during the last 12 months, that is from last October until now, you ever eat less than you felt you should because you did not have enough money to buy food.

1) Yes
2) No – *Go to F8* ☐

F7a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F8. Please tell me if during the last 12 months, that is from last October until now, you were ever hungry and did not eat because you did not have money to buy enough food.

1) Yes
2) No – *Go to F9*

F8a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

F9. Please tell me if during the last 12 months, that is from last October until now, you lose weight because you did not have enough money to buy food. This loss of weight should not be due to stress, hard work or sickness.

1) Yes
2) No

F10. Please tell me if during the last 12 months, that is from last October until now, you or another adult in your household stopped eating for an entire day because you did not have enough money to buy food.

1) Yes
2) No- END INTERVIEW.

F10a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

Thank you. This is the end of the interview.

Baseline Survey Instrument—2004

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR:_____ DATE: _____

Follow-up Survey Instrument—2006

EVALUATION OF THE IMPACT OF MALARIA DIALOGUE EDUCATION IN GHANA SURVEY QUESTIONNAIRE

INFORMED CONSENT

Hello. My name is _____ and I am working with AFRAM PLAINS RURAL BANK. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will help the Bank in its Credit with Education programme. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?
May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED ..... 1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIEWED ..... 2 —<END

RECORD | | | | | | | | |

SECTION A. IDENTIFICATION

IDENTIFICATION	
NAME OF RESPONDENT _____	
NAME OF COMMUNITY _____	
REGION CENTRAL ……01 EASTERN ……02	
COMMUNITY TYPE URBAN……..01 RURAL……..02	

SUMMARY	
RESULT OF INTERVIEW:	TOTAL PERSONS IN HOUSEHOLD ☐☐
COMPLETED……..1 ☐	TOTAL ELIGIBLE WOMEN (15-49 YRS.) ☐☐
UNCOMPLETED…….2	LINE NO. OF RESP. TO HOUSEHOLD QUEST. ☐☐

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____ ☐☐	☐☐	☐☐
DATE _____		

Follow-up Survey Instrument—2006

A01. DATE (DAY/MONTH/YEAR) ☐☐ ☐☐ 06	**A07**. REASONS FOR REPLACEMENT: ☐ (1) Could not be found (2) Did not wish to answer (3) Dropped out of Credit Association (4) NA
A02. NAME AND CODE OF INTERVIEWER ☐ _____	**A08.** NUMBER OF CREDIT ASSOCIATION ☐☐ (98) Not Applicable (N/A)
A03. NAME OF COMMUNITY _____	**A09.** How long have you been a member of Credit Association? ☐☐rs ☐☐ths DON'T KNOW ..... 98 FOR NON-CLIENTS FILL IN 0 YEARS 0 MONTHS
A04. NAME OF DISTRICT: (3) Asikuma-Odoben-Brakwa (2) Afram Plains ☐	**A10.** What was the amount of money given to you as loan by the Credit Association the last time? _____ DON'T KNOW……98 NON-CLIENTS ……99
A05. PERSON SELECTED IS A: ☐ (1) Client (2) Non-client– *Go to A11*	**A11.** COMPLETE NAME OF INTERVIEWEE _____ _____ First name Surname
A06. WAS SHE SELECTED FROM THE ORIGINAL LIST? (1) Yes – *Go to A08* ☐ (2) No (3) NA	**A12.** Name and Code of Supervisor ☐ _____

Follow-up Survey Instrument—2006

SECTION B. HOUSEHOLD SCHEDULE

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO RESPONDENT	SEX	RESIDENCE		AGE	WOMEN AGED 15-49	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with respondent	What is the relationship of (NAME) to the respondent?	Is (NAME) male or female? CIRCLE ANSWER	Does (NAME) usually live here? CIRCLE ANSWER	Did (NAME) stay here last night? CIRCLE ANSWER	How old is (NAME)? LESS THAN 1YR= ' 00' DON'T KNOW =98	CIRCLE LINE NUMBER OF ALL WOMEN AGED 15-49 CIRCLE ANSWER	FOR WOMEN AGED 15-49, ASK: Is (NAME) currently pregnant? CIRCLE ANSWER
B01	B02	B03	B04	B05	B06	B07	B08	B09
01		☐☐	M F 1 2	YES NO 1 2	YES NO 1 2	IN YEARS ☐☐	**01**	YES NO/DK 1 2
02		☐☐	1 2	1 2	1 2	☐☐	**02**	1 2
03		☐☐	1 2	1 2	1 2	☐☐	**03**	1 2
04		☐☐	1 2	1 2	1 2	☐☐	**04**	1 2
05		☐☐	1 2	1 2	1 2	☐☐	**05**	1 2
06		☐☐	1 2	1 2	1 2	☐☐	**06**	1 2
07		☐☐	1 2	1 2	1 2	☐☐	**07**	1 2
08		☐☐	1 2	1 2	1 2	☐☐	**08**	1 2
09		☐☐	1 2	1 2	1 2	☐☐	**09**	1 2
10		☐☐	1 2	1 2	1 2	☐☐	**10**	1 2

* CODES FOR B03 RELATIONSHIP TO RESPONDENT
01 = RESPONDENT
02 = HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = MOTHER/FATHER
07 = MOTHER/FATHER-IN-LAW
08 = BROTHER OR SISTER
09 = ADOPTED/FOSTER/STEPCHILD
10 = OTHER RELATIVE
11 = NOT RELATED
98 = DON'T KNOW

Follow-up Survey Instrument—2006

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO RESPONDENT	SEX	RESIDENCE		AGE	WOMEN AGED 15-49	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with respondent.	What is the relationship of (NAME) to the respondent?	Is (NAME) male or female? CIRCLE ANSWER	Does (NAME) usually live here? CIRCLE ANSWER	Did (NAME) stay here last night? CIRCLE ANSWER	How old is (NAME)? LESS THAN 1YR='00' DON'T KNOW =98	CIRCLE LINE NUMBER OF ALL WOMEN AGED 15-49 CIRCLE ANSWER	FOR WOMEN AGED 15-49, ASK: Is (NAME) currently pregnant? CIRCLE ANSWER
B01	B02	B03	B04	B05	B06	B07	B08	B09
			M F	YES NO	YES NO	IN YEARS		YES NO/DK
11			1 2	1 2	1 2		**11**	1 2
12			1 2	1 2	1 2		**12**	1 2
13			1 2	1 2	1 2		**13**	1 2
14			1 2	1 2	1 2		**14**	1 2
15			1 2	1 2	1 2		**15**	1 2
16			1 2	1 2	1 2		**16**	1 2
17			1 2	1 2	1 2		**17**	1 2
18			1 2	1 2	1 2		**18**	1 2
19			1 2	1 2	1 2		**19**	1 2
20			1 2	1 2	1 2		**20**	1 2

TICK HERE IF CONTINUATION SHEET USED ☐

Just to make sure that I have a complete listing:

1) Are there any other persons such as small children or infants that we have not listed? YES ☐→ ENTER EACH IN TABLE NO ☐

2) In addition, are there any other people who may not be members of your family, such as domestic servants, lodgers or friends who usually live here? YES ☐→ ENTER EACH IN TABLE NO ☐

3) Are there any guests or temporary visitors staying here, or anyone else who slept here last night, who have not been listed? YES ☐→ ENTER EACH IN TABLE NO ☐

Follow-up Survey Instrument—2006

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
B10	What is the **MAIN** source of drinking water for members of your household? RECORD ONLY ONE RESPONSE	PIPED WATER PIPED INTO DWELLING ..... 11 PIPED INTO YARD/PLOT ..... 12 PUBLIC TAP ..... 13 WATER FROM OPEN WELL OPEN WELL IN DWELLING ..... 21 OPEN WELL IN YARD/PLOT ..... 22 OPEN PUBLIC WELL ..... 23 WATER FROM COVERED WELL OR BOREHOLE COVERED WELL IN DWELLING ..... 31 COVERED WELL IN YARD/PLOT ..... 32 COVERED PUBLIC WELL ..... 33 BOREHOLE……34 SURFACE WATER SPRING ..... 41 RIVER/STREAM ..... 42 POND/LAKE..... 43 DAM ..... 44 RAINWATER..... 51 TANKER/TRUCK WATER ..... 61 BOTTLED WATER..... 71 SACHET WATER…… 81 OTHER _____ 96 (SPECIFY)	
B11	What kind of toilet facilities does your household use?	FLUSH TOILET PUBLIC FLUSH TOILET..... ……11 PRIVATE FLUSH TOILET…….... ….12 PIT TOILET/LATRINE PUBLIC TRADITIONAL PIT TOILET ..... ……21 PRIVATE TRADITIONAL PIT TOILET…. ..... 22 VENTILATED IMPROVED PIT (VIP) LATRINE PUBLIC (VIP) LATRINE ..... 31 PRIVATE (VIP) LATRINE ..... 32 BUCKET LATRINE ..... 3 NO FACILITY/BUSH/FIELD.... ……41 OTHER _____ 96 (SPECIFY)	
B12	Does your household have any mosquito nets that can be used while sleeping?	YES ..... 1 ⟶ NO ..... 2 ⟶ IF YES SKIP TO B14, IF NO GO TO B13	B14 B13
B13	Why does your household not have a mosquito net?	CANNOT AFFORD..... 11 NOT AVAILABLE..... 12 DO NOT NEED NET ..... 13 PREVIOUS ONE DAMAGED ..... 14 OTHER _____ 96 (SPECIFY)	SKIP TO C01
B14	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS ☐	

Follow-up Survey Instrument—2006

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
B15	Was the mosquito net(s) purchased by you or someone in your family or given to you for free/as a gift?	PURCHASED..... 1 ⟶ GIVEN AS GIFT/FOR FREE..... 2 ⟶ IF PURCHASED GO TO B16, IF FREE SKIP TO B19	B16 B19
B16	Who purchased the net?	RESPONDENT ..... 11 HUSBAND..... 12 MOTHER..... 13 MOTHER-IN-LAW……..... 14 ANOTHER FAMILY MEMBER..... 15 GIVEN BY SOMEONE……. ..... 16 OTHER _____ 96 (SPECIFY)	
B17	How much was paid for each net?	20,000 CEDIS ..... 11 40,000 CEDIS ..... 12 80,000 CEDIS ..... 13 OTHER _____ 96 (SPECIFY) DON'T KNOW..... 98	
B18	Where was/were the net(s) purchased from?	MARKET ..... 11 KIOSK/STREET VENDOR..... 12 ITINERANT VENDOR..... 13 CHEMICAL SHOP ..... 14 GENERAL SHOP..... 15 TEXTILE SHOP ..... 16 SUPERMARKET..... 17 TAILOR/SEAMSTRESS..... 18 PETROL STATION ..... 19 EMPLOYER ..... 20 CLINIC/HOSPITAL..... 21 PROJECT (I.E. NGO..... 22 WOMEN'S GROUP..... 23 OTHER _____ 96 (SPECIFY) DON'T KNOW..... 98	
B19	Who or what organization gave you the net(s)?	1 2	

		NET # 1	NET #2	NET #3
B20	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. ASK TO SEE THE BED NET AND INSPECT IT FOR HOLES OR TEARS. **NO HOLES/TEARS = GOOD CONDITION** **VISIBLE HOLES & /OR TEARS = DAMAGED** IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE (S).	OBSERVED GOOD CONDITION..... 1 OBSERVED DAMAGED..... 2 NOT OBSERVED 3	OBSERVED GOOD CONDITION .....1 OBSERVED DAMAGED .....2 NOT OBSERVED.....3	OBSERVED GOOD CONDITION.....1 OBSERVED DAMAGED.....2 NOT OBSERVED 3
B21	How long ago did your household obtain the mosquito net?	< 6 MTHS..... 1 6MTH – <1 YR..... 2 1 YR–<2 YRS ..... 3 2 – 3 YRS. ..... 4 3 YRS AND MORE 5	< 6 MTHS ..... 6MTH – <1 YR .....2 1 YR - <2 YRS.....3 2 – 3 YRS.....4 3YRS AND MORE 5	< 6 MTHS.....1 6MTH–<1 YR .....2 1 YR–<2 YRS .....3 2 – 3 YRS.....4 3YRS AND MORE 5
B22	OBSERVE OR ASK THE BRAND OF MOSQUITO NET.	'PERMANENT'NET[1] VESTERGAARD..... 11 ┐ (SKIP TO B23) =┘ 'PRETREATED' NET DAWA ..... 21 KO NET..... 22 PERMANET ..... 23 OTHER ..... 31 DON'T KNOW..... 98	'PERMANENT' NET VESTERGAARD ... 11 ┐ (SKIP TO B23) =┘ 'PRETREATED' NET DAWA.....21 KO NET .....22 PERMANET .....23 OTHER.....31 DON'T KNOW 98	'PERMANENT' NET VESTERGAARD 11 ┐ (SKIP TO B23) =┘ 'PRETREATED'NET DAWA .....21 KO NET.....22 PERMANET .....23 OTHER .....31 DON'T KNOW.....98
B23	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes?	YES..... 1 NO ..... 2 (SKIP TO B24) =——┤ DON'T KNOW..... 8	YES .....1 NO.....2 (SKIP TO B24) =——┤ DON'T KNOW 8	YES.....1 NO.....2 (SKIP TO B24) =——┤ DON'T KNOW.....8
B24	How long ago was the net last soaked or dipped? IF LESS THAN 1 MONTH, RECORD '00'.	MOS AGO ☐☐ MORE THAN 3 YEARS AGO..... 96 DON'T KNOW..... 98	MOS AGO ☐☐ MORE THAN 3 YEARS AGO .....96 DON'T KNOW 98	MOS AGO ☐☐ MORE THAN 3 YEARS AGO .....96 DON'T KNOW.....98
B25	Did anyone sleep under this mosquito net last night?	YES..... 1 NO ..... 2 (SKIP TO B26) =——┤ DON'T KNOW..... 8	YES ..... 1 NO..... 2 (SKIP TO B26) =——┤ DON'T KNOW 8	YES.....1 NO.....2 .... (SKIP TO B26) =——┤ DON'T KNOW.....8

		NET #1	NET #2	NET #3
B26	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐	NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐	NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐ NAME ___________ LINE NO ☐☐
B27		GO BACK TO B14 FOR NEXT NET; OR, IF NO MORE NETS, END HOUSEHOLD QUESTIONNAIRE AND GO TO SECTION C.	GO BACK TO B14 FOR NEXT NET; OR, IF NO MORE NETS, END HOUSEHOLD QUESTIONNAIRE AND GO TO SECTION C.	GO BACK TO B14 IN THE FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE NETS, END HOUSEHOLD QUESTIONNAIRE AND GO TO SECTION C.
	[1] "Permanent" is a pretreated net that does not require any further treatment. [2] "Pretreated" is a net that has been pretreated, but requires further treatment after 6-12 months.			
TICK HERE IF CONTINUATION SHEET USED ☐				

Follow-up Survey Instrument—2006

SECTION C. RESPONDENT'S BACKGROUND

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD FIVE YEARS OR LESS. (BORN ON MARCH 1, 2001 OR LATER)

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
C01	RECORD RESPONDENT'S NAME _____ RECORD RESPONDENT'S LINE NUMBER [ ][ ]		
C02	In what month and year were you born?	MONTH ..... [ ][ ] DON'T KNOW MONTH ..... 98 YEAR..... [ ][ ][ ][ ] DON'T KNOW YEAR..... 9998	
C03	How old were you at your last birthday? COMPARE AND CORRECT C02 AND/OR C03 IF INCONSISTENT.	AGE IN COMPLETED YEARS [ ][ ] DON'T KNOW =98	
C04	Have you ever attended school?	YES ..... 1 NO 2	--<C07
C05	What is the highest level of school you attended?	PRIMARY ..... 1 JSS/MIDDLE ..... 2 SSS/VOCATIONAL/TECHNICAL ..... 3 HIGHER..... 4 ISLAMIC SCH..... 5 OTHER _____ 9 (SPECIFY)	
C06	What is the highest (grade/form/year) you completed at that level?	FORM/CLASS..... [ ][ ] COMPLETED 10	
C07	What is your religion?	CHRISTIAN ..... 1 MUSLIM..... 2 AFRICAN TRADITIONAL RELIGION..... 3 OTHER _____ 9 (SPECIFY)	

Follow-up Survey Instrument—2006

C08 Now I would like to record the names of all your births in the last six years (BORN ON MARCH 1, 2000 OR LATER), whether still alive or not, starting with the most recent one you had.
RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

C09 What name was given to your (most recent/ previous) birth? (NAME)	C10 Were any of these births twins/triplets?	C11 Is (NAME) a boy or a girl?	C12 In what month and year was (NAME) born? PROBE: What is his/her birthday? DON'T KNOW MONTH =98	C13 Is (NAME) still alive?	C14 IF ALIVE: How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS. Ask for CWC card to confirm age if available IF < 1 YR., RECORD 00	C15 IF ALIVE Is (NAME) living with you?	C16 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD (**FROM B01**) (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD)	C17 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)?
01	SING ...1 MULT ..2	BOY.. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES .....1 NO.....2	LINE NUMBER ☐☐ ↓ (NEXT BIRTH)	
02	SING ...1 MULT ..2	BOY.. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES .....1 NO.....2	LINE NUMBER ☐☐	YES .....1 NO.....2 IF YES, ADD TO LIST
03	SING ...1 MULT ..2	BOY.. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES .....1 NO.....2	LINE NUMBER ☐☐	YES .....1 NO.....2 IF YES, ADD TO LIST
04	SING ...1 MULT ..2	BOY.. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES .....1 NO.....2	LINE NUMBER ☐☐	YES .....1 NO.....2 IF YES, ADD TO LIST
05	SING ...1 MULT ..2	BOY.. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES .... 1 NO..... 2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES .....1 NO.....2	LINE NUMBER ☐☐	YES .....1 NO.....2 IF YES, ADD TO LIST

Follow-up Survey Instrument—2006

C08 Now I would like to record the names of all your births in the last six years (BORN ON MARCH 1, 2000 OR LATER), whether still alive or not, starting with the most recent one you had.
RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

C09	C10	C11	C12	C13	C14 IF ALIVE:	C15 IF ALIVE	C16 IF ALIVE:	C17
06	SING .....1 MULT 2	BOY .... 1 GIRL.... 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES.....1 NO 2	LINE NUMBER ☐☐	YES .....1 NO.....2 IF YES, ADD TO LIST

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
C18	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)?	YES .....1 NO 2	
C19	CHECK C14 AND ENTER THE NUMBER OF BIRTHS FROM MARCH 1, 2001[1] OR LATER. IF NONE, RECORD '0'.		☐
C20	Are you pregnant now?	YES.....1 NO.....2 DON'T KNOW.....8	☐ <D01
C21	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS..... ☐☐ DON'T KNOW……98	

[1] For fieldwork beginning in 2004, 2005 or 2006, the year should be 1999, 2000 or 2001, respectively.

Follow-up Survey Instrument—2006

SECTION Da. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD FIVE YEARS OR LESS. (BORN ON MARCH 1, 2001 OR LATER)

D01	ENTER IN D02 THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask you some questions about your last pregnancy that ended in a live birth.		
D02	FROM QUESTIONS C09 AND C13	LAST BIRTH LINE NUMBER ..... ☐☐ NAME _____ LIVING = 1 ☐ DEAD = 2 ☐	
D03	When you were pregnant with (NAME), did you see anyone for antenatal care? IF YES: (1) Whom did you see? (2) Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR.....01 NURSE/MIDWIFE.....02 AUXILIARY MIDWIFE.....03 OTHER PERSON TRADITIONAL BIRTH ATTENDANT.....04 OTHER _____ 05 (SPECIFY) NO ONE.....06	
D04	CHECK D03: ANTENATAL CARE FROM A HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY?	CODE '01', '02', OR '03' CIRCLED (WRITE '1' IN BOX) ☐ CODE '04', '05' OR '06' CIRCLED (WRITE '2' IN BOX) ☐	
D05	During this pregnancy, did you take any drugs in order **to prevent you from getting malaria**?	YES.....1 NO.....2 DON'T KNOW.....8	☐ <D10
D06	Which drugs did you take to prevent malaria? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	FANSIDAR/SP.....01 CHLOROQUINE.....02 OTHER _____ 03 (SPECIFY) DON'T KNOW.....98	
D07	CHECK D06: DRUGS TAKEN FOR MALARIA PREVENTION	CODE "01" CIRCLED (WRITE '1' IN BOX) ☐ CODE "01" NOT CIRCLED (WRITE '2' IN BOX) ☐	→D10

D08	How many times did you take **Fansidar/SP** during this pregnancy?	TIMES..... ☐☐	

D09	Did you get the **Fansidar/SP** during an antenatal visit, during another visit to a health facility, or from some other source?	ANTENATAL VISIT .....1 ANOTHER FACILITY VISIT .....2 OTHER SOURCE _____ 6 (SPECIFY)	
D10	CHECK C14 AND C15: ONE OR MORE LIVING CHILDREN BORN FROM MARCH 1, 2001 OR LATER (WRITE '1' IN BOX) NO LIVING CHILDREN BORN FROM MARCH 1, 2001 OR LATER (WRITE '2' IN BOX)	—< E 01	

D10	CHECK C14 AND C15: ONE OR MORE LIVING CHILDREN BORN FROM MARCH 1, 2001 OR LATER (WRITE '1' IN BOX) NO LIVING CHILDREN BORN FROM MARCH 1, 2001[1] OR LATER (WRITE '2' IN BOX)	—< E 01	

Follow-up Survey Instrument—2006

SECTION Db. FEVER/ MALARIA IN CHILDREN

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD FIVE YEARS OR LESS. (BORN ON MARCH 1, 2001 OR LATER)

D11	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD BORN FROM MARCH 1, 2001 OR LATER. (IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN FROM MARCH 1, 2001 OR LATER, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of all your children **less than 5 years** old. (We will talk about each one separately.)		
D12	NAME AND LINE NUMBER FROM C09 AND C16	YOUNGEST CHILD LINE NUMBER ☐☐ NAME _____	NEXT-TO-YOUNGEST CHILD LINE NUMBER ☐☐ NAME _____
D13	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES..... 1 NO ..... 2 (SKIP TO NEXT-TO-YOUNGEST CHILD) DON'T KNOW..... 8	YES..... 1 NO ..... 2 (SKIP TO NEXT CHILD) DON'T KNOW..... 8
D14	Does (NAME) have a fever now?	YES..... 1 NO2 DON'T KNOW8	YES..... 1 NO ..... 2 DON'T KNOW..... 8
D15	Did you seek advice or treatment for (NAME'S) fever?	YES..... 1 NO ..... 2 (SKIP TO D23) =———	YES..... 1 NO ..... 2 (SKIP TO D23) =———
D17	How long after you noticed (NAME'S) fever did you seek treatment from that person/place?	SAME DAY ..... 0 NEXT DAY..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE OR MORE DAYS AFTER THE FEVER..... 3 DON'T KNOW..... 8	SAME DAY ..... 0 NEXT DAY..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE OR MORE DAYS AFTER THE FEVER..... 3 DON'T KNOW..... 8
D18	Who decided that you should go there for (NAME'S) illness? RECORD ALL MENTIONED.	RESPONDENT..... 1 HUSBAND/PARTNER..... 2 RESPONDENT'S MOTHER..... 3 MOTHER-IN-LAW ..... 4 FRIENDS/NEIGHBORS ..... 5 OTHER _____ 6 (SPECIFY)	RESPONDENT..... 1 HUSBAND/PARTNER..... 2 RESPONDENT'S MOTHER..... 3 MOTHER-IN-LAW ..... 4 FRIENDS/NEIGHBORS ..... 5 OTHER _____ 6 (SPECIFY)

Follow-up Survey Instrument—2006

Did you go anywhere else for advice or treatment for (NAME'S) fever?	YES ..... 1 NO ..... 2 (SKIP TO D23) =-——┘	YES ..... 1 NO ..... 2 (SKIP TO D23) =-——┘
Where did you go **NEXT** for advice or treatment?[2] IF SOURCE IS HEALTH FACILITY, WRITE THE NAME OF THE PLACE, _____ (NAME OF PLACE)	HEALTH FACILITY HOSPITAL ..... 01 HEALTH CENTER ..... 02 COMMUNITY HEALTH OFFICER ..... 03 HEALTH VOLUNTEER ..... 04 PRIVATE CLINIC ..... 05 OTHER SOURCE CHEMICAL SHOP ..... 06 TBA ..... 07 HERBALIST/SPIRITUALIST ..... 08 COMMUNITY-BASED DISTRIBUTORS ..... 09 DRUG PEDDLER ..... 10 FRIEND/RELATIVE ..... 11 OTHER _____ 12 (SPECIFY)	HEALTH FACILITY HOSPITAL ..... 01 HEALTH CENTER ..... 02 COMMUNITY HEALTH OFFICER ..... 03 HEALTH VOLUNTEER ..... 04 PRIVATE CLINIC ..... 05 OTHER SOURCE CHEMICAL SHOP ..... 06 TBA ..... 07 HERBALIST/SPIRITUALIST ..... 08 COMMUNITY-BASED DISTRIBUTORS ..... 09 DRUG PEDDLER ..... 10 FRIEND/RELATIVE ..... 11 OTHER _____ 12 (SPECIFY))
How long after you noticed (NAME'S) fever did you seek treatment from that person/place?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE OR MORE DAYS AFTER THE FEVER ..... 3 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE OR MORE DAYS AFTER THE FEVER ..... 3 DON'T KNOW 8

LOOK AT THE RESPONSES TO QUESTIONS D16 AND D20 TO SEE IF A HEALTH FACILITY WAS CIRCLED FOR EITHER QUESTION
 	
IF (NAME) WAS **TAKEN** TO A HEALTH FACILITY--- --------GO TO D22
 	
IF (NAME) WAS **NOT TAKEN** TO A HEALTH FACILITY------GO TO D23		

Was (NAME) treated with any medicine(s) before going to the health facility?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8

Follow-up Survey Instrument—2006

D23	Was (NAME) treated with any medicine(s)?	YES..... 1 NO.....2 DON'T KNOW…….....8	YES..... 1 NO.....2 DON'T KNOW…….....8
D24	**Which medicines were given to (NAME) for his/her fever?2** CIRCLE ALL MEDICINES THAT WERE GIVEN. IF MOTHER IS UNABLE TO RECALL DRUG NAME(S), ASK HER TO SHOW THE DRUG (S) TO YOU. IF SHE IS UNABLE TO SHOW THEM, SHOW HER TYPICAL ANTIMALARIALS AND HAVE HER IDENTIFY WHICH WERE GIVEN. FOR EACH ANTIMALARIAL MEDICINE ASK: **How long after the fever started did (NAME) start taking the medicine?** CIRCLE THE APPROPRIATE CODE. CODES: SAME DAY = 0 NEXT DAY = 1 TWO DAYS AFTER THE FEVER = 2 THREE OR MORE DAYS AFTER THE FEVER = 3 DON'T KNOW = 8	**ANTIMALARIAL DRUGS** A. CHLOROQUINE .... 0 1 2 3 8 B. FANSIDAR ..... 0 1 2 3 8 C. AMODIAQUINE..... 0 1 2 3 8 D. QUININE ..... 0 1 2 3 8 **OTHER DRUGS** E. ASPIRIN F. PANADOL G.PARACETAMOL H. CO-TRIMOXAZOLE X. OTHER _____ ***(SPECIFY)*** Z. UNKNOWN DRUG	**ANTIMALARIAL DRUGS** A. CHLOROQUINE ....0 1 2 3 8 B. FANSIDAR.....0 1 2 3 8 C. AMODIAQUINE ....0 1 2 3 8 D. QUININE.....0 1 2 3 8 **OTHER DRUGS** E. ASPIRIN F. PANADOL G.PARACETAMOL H. CO-TRIMOXAZOLE X. OTHER _____ ***(SPECIFY)*** Z. UNKNOWN DRUG
D25	Did (NAME) get any injection or suppository for the (fever/convulsions)? RECORD ONLY ONE RESPONSE.	INJECTION ONLY..... 1 SUPPOSITORY ONLY..... 2 BOTH ..... 3 NEITHER..... 4 DON'T KNOW..... 8	INJECTION ONLY.....1 SUPPOSITORY ONLY.....2 BOTH .....3 NEITHER.....4 DON'T KNOW.....8

[1] For fieldwork beginning in 2004, 2005 or 2006, the year should be 1999, 2000 or 2001, respectively.
[2] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.

TICK HERE IF CONTINUATION SHEET USED ☐

Follow-up Survey Instrument—2006

SECTION E. KNOWLDEGE ABOUT MALARIA

TO BE ADMINISTERED ONLY TO RESPONDENT OR HOUSEHOLD MEMBER WITH A CHILD FIVE YEARS OR LESS. (BORN ON MARCH 1, 2001 OR LATER)

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E01	What causes malaria? RECORD ALL MENTIONED. Anything else?	MOSQUITO BITES ..... 1 SPIRITUAL (superstitious belief). ..... 2 STAYING IN THE SUN FOR TOO LONG ..... 3 WORKING CLOSE TO FIRE FOR LONG PERIODS ..... 4 OVERWORKING YOURSELF ..... 5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E02	Describe the way in which one gets malaria – how is it transmitted? RECORD ALL MENTIONED	MOSQUITO BITES INFECTED MAN ..... 1 PARASITE DEVELOPS IN MOSQUITO ..... 2 MATURE PARASITE IS TRANSFERRED TO MAN WHO BECOMES INFECTED ..... 3 OTHER _____ 4 (SPECIFY) OTHER _____ 5 (SPECIFY) DON'T KNOW 8	
E03	How does one protect himself from getting malaria? RECORD ALL MENTIONED.	BY SLEEPING UNDER ITN ..... 1 BY WEARING CLOTHING TO COVER THE BODY ..... 2 BY CLEARING BUSHES AROUND/SURROUNDING ..... 3 BY DISTURBING MOSQUITO HIDING PLACES IN YOUR ROOM ..... 4 MOSQUITO COILS ..... 5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E04	State the best way to prevent malaria. RECORD ONLY ONE RESPONSE	BY USING AN IMPREGNATED BED NET ..... 1 OTHER _____ 2 (SPECIFY) DON'T KNOW 8	

Follow-up Survey Instrument—2006

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E05	How do you know that a child has malaria? RECORD ALL MENTIONED.	FEVER ..... 11 CHILLS ..... 12 VOMITS ..... 21 LACK OF APPETITE ..... 22 DIZZINESS ..... 31 HEADACHE ..... 32 PAIN IN JOINTS, BONES, ETC. ..... 33 CONSTIPATION ..... 41 DIARRHOEA ..... 42 YELLOWISH/DARK URINE ..... 43 OTHER _____ 51 (SPECIFY) OTHER _____ 61 (SPECIFY) DON'T KNOW 98	
E06	Which groups of people are the most vulnerable to the effects of malaria within this community? RECORD ALL MENTIONED.	YOUNG CHILDREN (BELOW 5YRS) ..... 1 SCHOOL AGED CHILDREN (6-14 YRS) ..... 2 PREGNANT WOMEN ..... 3 WOMEN OF CHILD BEARING AGE (15-49 YRS) ..... 4 ADOLESCENT BOYS (15-18 YRS) ..... 5 ADULT MALES (ABOVE 18 YRS) ..... 6 EVERYONE ..... 7 DON'T KNOW 8	
E07	What are the signs that tell you that a child is seriously ill – with severe malaria or some other severe illness? RECORD ALL MENTIONED. PROBE FOR RESPONSES.	VOMITS EVERYTHING/REPEATED VOMITING ..... 11 CAN'T BREASTFEED/EAT/DRINK ..... 12 DIFFICULTY IN BREATHING/RAPID BREATHING ..... 21 LETHARGY/SEVERE WEAKNESS ..... 22 CONVULSIONS ..... 23 DARK COLOURED/COCA COLA URINE ..... 31 EXTREME PALLOR/YELLOW EYES ..... 32 FAILURE TO RESPOND TO INITIAL TREATMENT ..... 41 OTHER _____ 51 (SPECIFY) OTHER _____ 61 (SPECIFY) DON'T KNOW 98	
E08	If a child less than 5yrs old has a fever what should his mother/caretaker do? RECORD ALL MENTIONED.	SPONGE WITH TEPID WATER ..... 1 GIVE CHLOROQUINE ..... 2 GIVE PARACETAMOL ..... 3 GIVE FRUIT JUICE ..... 4 TAKE TO NEAREST HEALTH FACILITY IMMEDIATELY ..... 5 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	

Follow-up Survey Instrument—2006

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
E09	I'm going to read a statement. Tell me if you agree with it or not. 'A mother is giving her child with malaria drugs as prescribed. On the second day, the child starts to eat and play again. The child no longer feels warm to touch. The mother can stop giving the child the rest of the malaria treatment. She can save it for next time.'	AGREE ..... 1 DON'T AGREE ..... 2 DON'T KNOW 8	
E10	What could happen to a pregnant woman who gets malaria? RECORD ALL MENTIONED.	SHE COULD DIE ..... 1 HAVE A MISCARRIAGE/ABORT/HAVE A STILLBIRTH ..... 2 SHE COULD BECOME ANAEMIC ..... 3 SHE COULD BLEED PROFUSELY DURING/AFTER DELIVERY ..... 4 SHE COULD HAVE PREMATURE/ SMALL FOR DATE BABY ..... 5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E11	What should a pregnant woman do to protect herself from malaria? RECORD ALL MENTIONED. PROBE FOR RESPONSES	START ANC AS SOON AS PREGNANT ..... 1 SLEEP UNDER INSECTICIDE TREATED NETS ..... 2 TAKE ANTIMALARIALS AS DIRECTED ..... 3 EAT GOOD FOOD/BALANCED DIET ..... 4 TREAT WORM INFESTATION AS DIRECTED ..... 5 KEEP SURROUNDINGS CLEAN ..... 6 OTHER _____ 7 (SPECIFY) DON'T KNOW 8	
E12	Can a pregnant woman have malaria and not show signs or not know?	YES ..... 1 NO ..... 2 DON'T KNOW 8	
E13	In the past year, where or from whom have you received any information regarding malaria? THIS INCLUDES MESSAGES ON ITNs, TREATMENT, PREVENTION, etc. RECORD ALL MENTIONED	RADIO ..... 11 TV ..... 12 NEWSPAPER/MAGAZINE ..... 13 SHOP EMPLOYEE ..... 14 POSTER IN SHOP ..... 15 HEALTH STAFF ..... 16 POSTER AT HEALTH FACILITY ..... 17 CHURCH ..... 18 SCHOOL ..... 19 DRAMA GROUP ..... 20 FRIENDS ..... 30 BILLBOARDS ..... 31 WOMEN'S GROUP ..... 32 CREDIT ASSOCIATIONS ..... 33 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	

Follow-up Survey Instrument—2006

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	E14 TO E17 TO BE ADMINISTERED ONLY TO CREDIT ASSOCIATION MEMBERS WHO HAVE HAD MALARIA EDUCATION		
E14	How many malaria education sessions did you attend last year?	1–2.....1 3–4.....2 5–6.....3 7–8.....4 9–10.....5 All.....6	
E15	Have you shared any information about malaria (that you learned at association meetings) with anyone?	YES..... 1 → NO ..... 2 → IF NO SKIP TO SECTION F	E15 Skip to Section F
E16	With whom did you share this information? RECORD ALL MENTIONED	FAMILY MEMBERS.....1 COMMUNITY LEADER.....2 NEIGHBOUR.....3 FRIEND.....4 OTHER COMMUNITY MEMBERS.....5 OTHER _____ 6 (SPECIFY) OTHER _____ 7 (SPECIFY)	
E17	What kind of information did you share? RECORD ALL MENTIONED	MALARIA IS CAUSED BY A MOSQUITO.....1 CHILDREN UNDER FIVE SHOULD SLEEP UNDER AN ITN.....2 PREGNANT WOMEN SHOULD SLEEP UNDER AN ITN.....3 ITNs ARE THE BEST PREVENTION METHODS FOR MALARIA.....4 CHILDREN UNDER AGE OF 2 MONTHS AND 5 YEARS WITH MALARIA SHOULD BE TREATED WITH FEVER-REDUCING DRUG AND THEN TAKEN TO HOSPITAL FOR TREATMENT....5 HOW MALARIA IS TRANSMITTED.....6 OTHER _____ 7 (SPECIFY) OTHER _____ 8 (SPECIFY)	

Follow-up Survey Instrument—2006

SECTION F. FOOD SECURITY

NOW I WILL ASK YOU QUESTIONS ABOUT THE FOOD EATEN IN YOUR HOUSEHOLD IN THE LAST 12 MONTHS; IN OTHER WORDS, FROM MARCH OF LAST YEAR UNTIL NOW.

F1. I will read 4 choices for your response. Please tell me which of the following best describes the food consumed in your household:

1) ALWAYS ATE ENOUGH OF WHAT I WANTED
2) I HAD ENOUGH FOOD BUT NOT ALWAYS THE KINDS I WANTED
3) SOMETIMES I DID NOT HAVE ENOUGH FOOD
4) OFTEN I DID NOT HAVE ENOUGH FOOD

F2. Please tell me if during the last 12 months, that is from last March until now, you were worried that your food would run out before you had money to buy more.

1) Yes
2) No –*Go to F3*

F2a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

F3. Please tell me if during the last 12 months, that is from last March until now, the food you had was not enough and you did not have enough money to buy more.

1) Yes
2) No – *Go to F4*

F3a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

F4. Please tell me if during the last 12 months, that is from last March until now, you had to eat the same foods daily because you did not have money to buy other foods.

1) Yes
2) No- *Go to F5*

F4a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

F5. Please tell me if during the last 12 months, that is from last March until now, you served yourself or any other adult in your household less food because you did not have enough money to buy food.

1) Yes
2) No – *Go to F6*

F5a. How often did this occur?

1) Often
2) Sometimes
3) Rarely

F6. Please tell me if during the last 12 months, that is from last March until now, you skipped any meals (breakfast, lunch or supper) because you did not have enough money for food.

1) Yes
2) No –*Go to F7* ☐

F6a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F7. Please tell me if during the last 12 months, that is from last March until now, you ever ate less than you felt you should because you did not have enough money to buy food.

1) Yes
2) No – *Go to F8* ☐

F7a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F8. Please tell me if during the last 12 months, that is from last March until now, you were ever hungry and did not eat because you did not have money to buy enough food.

1) Yes
2) No – *Go to F9* ☐

F8a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

F9. Please tell me if during the last 12 months, that is from last March until now, you lost weight because you did not have enough money to buy food. This loss of weight should not be due to stress, hard work or sickness.

1) Yes
2) No ☐

F10. Please tell me if during the last 12 months, that is from last March until now, you or another adult in your household stopped eating for an entire day because you did not have enough money to buy food.

1) Yes
2) No- END INTERVIEW. ☐

F10a. How often did this occur?

1) Often
2) Sometimes
3) Rarely ☐

Follow-up Survey Instrument—2006

G1. WAS RESPONDENT INTERVIEWED DURING BASELINE STUDY (i.e. November 2004)?

YES.....1

NO.....2

Thank you. This is the end of the interview.

NAME OF THE SUPERVISOR:_____ DATE: _____

Freedom from Hunger's Mission

Founded in 1946, Freedom from Hunger promotes "Self-Help for a Hungry World." Freedom from Hunger brings innovative and sustainable self-help solutions to the fight against chronic hunger and poverty. Together with local partners, we equip families with resource they need to build futures of health, hope and dignity.

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