American Red Cross

MID-TERM EVALUATION REPORT

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Integrated Child Health Project

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Cover photo taken by Liz Andrews, VSO Volunteer serving as the ICH Project BCC and Breastfeeding Technical Advisor; children participating in a hygiene edutainment session organized by the ICH BCC Team.

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ACRONYMS

ADRA	Adventist Development and Relief Agency
ANC	Ante-Natal Care
ARC	American Red Cross
BCC	Behavior Change Communication
BTC	Belgian Technical Cooperation Agency
CBSS	Community-based Surveillance System
CRC	Cambodian Red Cross
CS	Child Survival
CVCG	Community Volunteer Care Group
DIP	Detailed Implementation Plan
DTK	Diarrhea Treatment Kit
FO	Field Officer
HC	Health Center
HMIS	Health Management Information System
C-IMCI	Community Integrated Management of Childhood Illnesses
ICH	Integrated Child Health
IEC	Information, Education, Communication
IFRC	International Federation of Red Cross Red Crescent Societies
KPC	Knowledge, Practice, and Coverage
LLIN	Long-lasting, Insecticide-treated Mosquito Nets
M&E	Monitoring and Evaluation
MOH	Ministry of Health
MTE	Mid-Term Evaluation
NGO	Non-Governmental Organization
NIP	National Immunization Program
OD	Operational District (of the Ministry of Health)
ORS	Oral Rehydration Solution
PSI	Population Services International
RACHA	Reproductive and Child Health Alliance
TOT	Training of Trainers
USAID	United States Agency for International Development
VHSG	Village Health Support Group
WFP	World Food Program
WHO	World Health Organization

A. Executive Summary

The goal of the Integrated Child Health Project is to reduce child morbidity and mortality in a sustainable fashion. The project is implemented by the Cambodian Red Cross (CRC) with technical and financial support from the American Red Cross (ARC). The project has three strategic health objectives: 1) nutrition of children under two; 2) immunization; and 3) community management of the sick child. The project's fourth strategic objective focuses on strengthening the management capacity of the CRC. The project site is in the Angkor Chum Operational District of Siem Reap Province that covers three administrative districts: Varin, Angkor Chum, and Pourk. The estimated 2004 project site population is 213,749. The project serves an estimated population of 43,610 children under five years of age and 52,744 women of reproductive age.

Main Accomplishments

The ICH project is operational in 254 villages, mobilizing an extensive network of nearly 2,000 Red Cross volunteers. The ICH project team conducted two professional operational research studies, focusing on malaria control and immunization communication. Additionally, the team completed two insecticide treatment campaigns, coordinated the donation of 10,000 long-lasting insecticide treated bed nets, participated in a social marketing pilot of *Orasel* diarrhea treatment kits (reformulated oral rehydration salts with a zinc supplement) in 20 villages, conducted a volunteer motivation contest, and supported the ministry of Health (MOH) scale-up of the new vaccination fixed-site strategy with four health centers.

Overall Progress in Achieving Objectives

Data from the MTE provided solid indicators that the immunization intervention was being implemented successfully. Ninety-three percent of the 288 mothers who were interviewed showed their child's vaccination card. Of the 90 village leaders who were interviewed, 76 percent stated that they participated in the vaccination outreach in their village in the previous month. Data from 12 health centers showed that eleven centers covered 100 percent of the villages in their catchment area during outreach sessions.

With respect to diarrhea control, mothers' understanding was the strongest about the importance of taking children with severe diarrhea to the health center, in using boiled water, and in washing hands to prevent its occurrence. Topics that need to be strengthened are the use of oral rehydration solutions and not using antibiotics to treat diarrhea. In malaria control, more than 80 percent of the mothers were able to identify at least two signs of malaria. Additionally the MTE data showed that more than 80 percent of families had bed nets, which indicates a strong acceptance of the value of their use.

The project promoted prenatal care, and indications were that this emphasis contributed to an increase in the number of women who sought care. A comparison of the health center census for prenatal care showed an increase of 17 percent in July 2006 compared to January 2006 in prenatal visits.

Status of Cross-cutting Approaches

This project has excelled in communicating and planning with the MOH. National, provincial, district, and local MOH staff participated in all project stages, including the data analysis and action planning part of the MTE. The findings from the MTE showed that the health centers were consistent in outreach to the community and that village leaders were very active in a wide range of health and community development activities. Another strong indicator was that nearly all the village leaders stated that the Red Cross volunteers were active in the community. There is a strong foundation for community mobilization.

The CRC Siem Reap Branch Office has been strengthened in the following areas: the technical capacity of staff and Red Cross volunteers in immunization, diarrhea control, and malaria control and the establishment of a provincial monitoring and evaluation system.

In the area of behavior change, the information, education, and communication (IEC) materials are well designed, but the delivery method is strictly lecture. Participatory learning methods need to be introduced that engage mothers, Red Cross volunteers, and village leaders in discussion and decision making.

The care group model for organizing and supporting the Red Cross volunteers (called Community Volunteer Care Group or CVCG) is being implemented. The major area that needs attention is a full understanding among the project staff and the CVCG leaders on the role of the leader. The Red Cross volunteer drop-out rate was very low (less than five percent), and volunteers reported a high level of job satisfaction.

Main Constraints

The project was hindered by a delay in signing the grant agreement. The team, nevertheless, has made rapid progress. It is crucial however, that the project stays on track with the activities in the Detailed Implementation Plan (DIP). There is not enough time to add new interventions and activities.

Capacity-building Effects

Through the efforts of this project, capacity building has occurred with community organizations and the health centers as evidenced by the size of community mobilization. The CRC has been strengthened through technical training and the establishment of systems for managing this project.

Sustainability

Project elements that support sustainability are community mobilization and the MOH linkages. Additionally, the CRC is a national organization and is in a strong position to continue supporting Red Cross volunteers. The challenge that the CRC faces is establishing a system for supervising and supporting the volunteers after the grant funding ends.

Conclusions and Recommendations

The ICH Project has made excellent progress in promoting children's vaccination coverage and good progress in malaria and diarrhea control. Community mobilization is a strength of this

project. The project has implemented four innovative practices: 1) the care group model for health volunteers; 2) diarrhea treatment kits; 3) long-lasting insecticide treated bed nets; and 4) fixed-site vaccination strategy. The principle recommendations are implementation of participatory learning methods, strengthening the role of the CVCG leaders, and strengthening the system for staff supervision.

Grantee's response and action plan

Refer to Section II for the grantee's response and action plan.

B. Assessment of the Progress Made towards Program Objectives

1. Technical Approach

a. Overview

The project is implemented by the Cambodian Red Cross (CRC) with technical and financial support from the American Red Cross (ARC). The project site is in Angkor Chum Operational District in Siem Reap Province. The site contains three administrative districts: Pourk, Angkor Chum, and Varin. The estimated 2004 project site population is 213,749. The project serves an estimated population of 43,610 children under five years of age and 52,744 women of reproductive age. (Refer to the map in Attachment F: Special Reports.)

This project has three strategic health objectives: 1) nutrition of children under two, 2) immunization, and 3) community management of the sick child. It also has as an objective of developing the management capacity of the CRC.

The project interventions are implemented through the following four major cross-cutting strategies:

(1) Health education/coaching for behavior change through an extensive network of CRC Red Cross volunteers;
(2) Community mobilization for behavior change achieved by engaging opinion leaders and motivating community-based activities to reinforce health communication through the Red Cross volunteers;
(3) Coordination and continued involvement of other implementing partners to ensure synergistic program approaches; and
(4) Community-based surveillance systems that complement and support existing health management information systems (HMIS) while enhancing broader community participation in monitoring basic health statistics at the village level.

The ICH project is operational in 254 villages across three administrative districts, mobilizing an extensive network of nearly 2,000 Red Cross volunteers. Village sensitization, volunteer recruitment/election, community mapping, review of roles and responsibilities, review of ICH project goal and objectives, and assignment of households to Red Cross volunteers was undertaken in each village. Two professional operational research studies, focusing on malaria control and immunization communication as well as an exchange visit to the World Relief Child Survival Project in Kampong Cham, were also undertaken.

Additionally, the ICH project team managed the completion of two insecticide treatment campaigns, the donation of 10,000 long-lasting insecticide-treated bed nets, a social marketing pilot of *Orasel* diarrhea treatment kits (reformulated oral rehydration salts and zinc supplements) in 20 villages, completion of a volunteer motivation contest, and support for the MOH scale-up of the new vaccination fixed-site strategy with four health centers.

Finally, the ICH project team rolled out, to varying degrees, numerous technical interventions, to the community through the extensive Red Cross volunteer network. As of the MTE, technical training topics covered include: (1) facilitator skills, communication, and adult learning, (2) malaria transmission, prevention, and danger signs, (3) insecticide treatment of bed nets, (4) diarrhea prevention and control and recognition of danger signs, (5) diarrhea treatment kit social marketing, sales, and stock management, (6) Seven Fundamental Principles of the International Red Cross and Red Crescent Movement, (7) yellow vaccination card and growth monitoring, (8) vitamin A and antenatal care, and (9) an introduction to behavior change communication (BCC).

The local NGO partners are an important part of this project. The key partners and their respective activities are as follows:

- Population Services International (PSI) distributes and trains village volunteers and local shop keepers in the use of diarrhea treatment kits. These kits contain two packs of low osmolarity ORS with 10 tablets of 20 mg. dispersible zinc and a consumer insert containing information on correct use, danger signs, prevention and messages on continued feeding. PSI has a sub-grant with ARC/CRC to market these kits.
- Reproductive and Child Health Alliance (RACHA) participated in conducting two operational research studies. It implements a family planning program in collaboration with the MOH health centers, and it has a quality improvement program with the health centers.
- Adventist Development and Relief Agency (ADRA) works in water and sanitation, micro-credit, and literacy.
- Caritas implements a nutrition program with World Food Program (WFP) support in food-insecure areas, and it has a school feeding programs in four schools. Caritas runs a home-based care program for people living with HIV/AIDS. It also supports quality improvement at the MOH health centers.
- PLAN international has a national birth registration project as part of its child rights program. It is functioning in several villages of Angkor Chum Operational District (OD). It also supports the C-IMCI intervention in its programs.
- Belgium Technical Cooperation Agency (BTC) supports the development of the MOH's health infrastructure, supports access to secondary and tertiary care for the poor, and conducts social marketing through road safety campaigns and print materials.

b. Progress Report by Intervention Area

Immunization

Program Plan

The key components of this intervention in the DIP were as follows:

- Conduct a qualitative study to inform the development of a communication strategy to improve immunization coverage in Angkor Chum Operational District.[1] (Refer to Attachment F: Special Reports for a copy of the study.)
- Train the project staff in the immunization intervention.
- Train village leaders and Red Cross volunteers in immunization.

- Coordinate with the health centers and village leaders in scheduling and implementing vaccination outreach sessions.
- Assist the village leaders in coordinating outreach during the scheduled vaccination sessions.
- Collaborate with Red Cross volunteers and village leaders in following up on children who are behind schedule according to their age.

The work plan for fiscal year 2006 is presented in Table 1 below.

Table 1: ICHP Work plan for fiscal year 2006.

Major Activities	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2.1 Staff TOT training		X	X					
2.2 Village-based training in immunization			X	X				
2.3 Village-based training in micronutrients		X						
2.4 Home visits to improve turnout			X	X	X	X	X	X
2.5 Follow-up no-shows				X	X	X	X	X
2.6 Coordination meetings VHSG	X	X	X	X	X	X	X	X
2.7 Enhanced HC outreach (VAC)		X						
2.8 Community-based BCC activities					X	X	X	X
2.9 Supportive supervision and monitoring	X	X	X	X	X	X	X	X

Findings from the MTE

The March 2005 KPC baseline full immunization rate for children 12 to 23 months was 34 percent. The project has made a substantial contribution to improving this rate. Routine health center data presented by the MOH's operational district director during the MTE indicated that the current full immunization rates for the three districts have exceeded 80 percent. Data that are presented below gathered from interviews with mothers showed that mothers had vaccination cards in their possession and a strong understanding of the importance of vaccinations for their children's health.

A total of 288 mothers were interviewed for the MTE. (Refer to Attachment C for a description of the evaluation methodology.) Mothers were asked to show their child's vaccination card and were asked about the benefits of immunizations. They were then asked an open-ended question about the purpose of the card. They were not prompted to give a particular answer. Table 2 presents the findings from interviews with mothers.

Table 2: Mothers' Support of Vaccinations. N=288

Variable	Number	Percent
Mothers who showed their child's vaccination card	267	93 percent
Reason for card: follow up child's vaccination	225	78 percent
Reason for card: monitor growth	75	26 percent

Given the low baseline vaccination rate of 34 percent, the fact that such a high percentage of mothers showed their cards and that nearly 80 percent stated that it is used to follow up on a child's vaccinations indicates mothers' understanding and support for childhood vaccinations.

In addition, the low percentage of mothers who lost or discarded the card was an indicator that the vast majority of mothers understood the value of the card. The 93 percent of mothers who showed their immunization card was a substantial increase from the 61 percent who could do so during the baseline survey. This is important because one of the findings from the project team's formative research study on barriers to immunizations was that mothers could not find their child's vaccination card. (Refer to Attachment F: Special Reports.) The project team has done a good job in helping mothers value and retain the cards.

Another finding from the immunization research was that mothers of children not on schedule did not know the health benefits of vaccinations. The findings in Table 2, above, indicate that the project made good progress in increasing mothers' understanding of the protective value of vaccinations.

Community leadership was also an important factor in improving vaccination rates. When the health center staff and project team schedule vaccination outreach sessions in a village, the community leaders have the responsibility of notifying the village households and recruiting the mothers and their children. The evaluation team interviewed 90 village leaders. A total of 76 percent stated that they participated in the vaccination outreach session in their village in the previous month. When asked to list the things that they did with the local health center, 79 percent stated that they collaborated with vaccination outreach teams. The relatively high percent of leaders who participated in the previous month was an indication of good community participation. It should be noted that this time of year rice is being transplanted. That such a high percentage of farmers would take from a half to a whole day out of the fields to support vaccinations was a good indication of their support.

The evaluation team also interviewed staff from 12 health centers in the three districts. In reference to vaccinations, the team asked permission to see their records of villages covered in the previous month. In 11 health centers they covered 100 percent of the targeted villages in their catchment area. In the other center they covered all but one village. Thus the health centers were doing their job in providing vaccination services to their respective villages.

The reason that the one health center did not have a record of full coverage in the past month was because it was participating in the MOH's pilot fixed-site model. In the fixed-site strategy, vaccinations are conducted at the health center rather than in the community. Vaccination records are checked and updated as needed when mothers visit the health center for their family's and their own health care. As part of the fixed-site model, the project supports transportation costs for village leaders, VHSGs, and volunteer leaders to attend monthly meetings at the health center. These meetings are used to review health statistics and plan follow up to households needing to come to the health center for vaccinations. Red Cross volunteers follow up by reminding households of the need to go to the health center (see Section 2.c.iv.), for a discussion on the roles of the volunteers). This activity is closely monitored by each health center and the OD to ensure that vaccination rates for the fixed-site strategy villages do not decrease. Preliminary data on this strategy has shown it to be effective. (Refer to Attachment F: Understanding Immunization and Vitamin A Communication in Rural Cambodia: A Formative Research Study)

Another component of the immunization intervention is promoting the consumption of vitamin A-rich foods. The Red Cross volunteers and field officers used the monthly vaccination outreach sessions as an opportunity to teach the value of this micronutrient and the foods that contain it.

To assess their knowledge, the mothers were asked during the MTE field interviews to identify foods that were rich in vitamin A. They were shown a graphic that had six pictures of foods, three of which contained vitamin A. (Note: the pictures used in this graphic were from the project's IEC materials.) More than 85 percent of the mothers identified at least two foods correctly and more than 60 percent identified all three. Less than 25 percent, however,, correctly identified the three correct pictures and correctly rejected the three that did not have vitamin A. The most common point of confusion was that mothers pointed to the picture with bananas as a food that is rich in vitamin A. When they were debriefed after the interview, mothers stated that they selected bananas because it was a fruit.

This part of the interview with mothers provided evidence of progress in mothers' understanding of vitamin A sources. The fact that a large majority of mothers identified at least two of three vitamin A-rich foods is a good sign of progress. Traditional eating habits play an important role in that marigold leaves (which are very rich in vitamin A) are a staple in people's diet. The challenge is to ensure that children between 6 and 23 months also consume other vegetables and fruit that are rich in vitamin A.

In summary, MTE data from mothers, community leaders, and the health centers provided solid indicators that this intervention is being implemented successfully.

Recommendation #1. The fixed-site strategy is an innovative concept being implemented by the project as a pilot. It is a departure from the strategy previously held by the MOH National Immunization Program (NIP). Following a successful pilot supported by WHO, the NIP approved a carefully monitored scale-up of the approach. The project team should expand its pilot and implement it in all health centers that qualify.

Community Management of the Sick Child: Diarrhea Control

Program Plan

The plan in the DIP was to manage childhood illnesses through improved home management of sick children and by early identification and referral for danger signs as well as improved malaria prevention and treatment. Additionally, the plan included increased referrals from the village to the health center, improved coverage of insecticide-treated bed nets as well as improved hand washing practices during critical moments.

Table 3: Implementation Plan for Malaria and Diarrhea Prevention and Control.

Major Activities	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Strategy review and development	X	X									
Staff TOT training in malaria (MA)	MA	MA									
Village-based training in MA		MA	MA	X							
Staff TOT training in home care				X	X						
Village-based training in HC				X	X						
Staff TOT training in DTK								X	X		
Village-based training in DTK								X	X		
Home visits re home management*		X	X	X	X	X	X	X	X	X	X
Staff TOT				pilot	X						
Village-based training				pilot	X	X					
Village-based referral system						X	X	X	X	X	X
Mosquito net social marketing									X	X	X
Community-based BCC activities								X	X	X	X
Supervision and monitoring	X	X	X	X	X	X	X	X	X	X	X
*includes hand washing											

Findings from the MTE

The project focused on two childhood illnesses: diarrhea and malaria. The project team concentrated on the topic of diarrhea over the last six months. When the Red Cross volunteers were asked what topics they had been taught, more than 90 percent identified diarrhea prevention and treatment as a training topic. Additionally, 78 percent of the village leaders stated they had been trained in this topic.

The project staff, with technical assistance from the provincial health department and the OD, designed attractive, pictorial IEC materials. The pictorial images predominate over the text, and they are culturally appropriate. Some of pictures were used in the interviews with mothers who were able to easily state what the pictures represented.

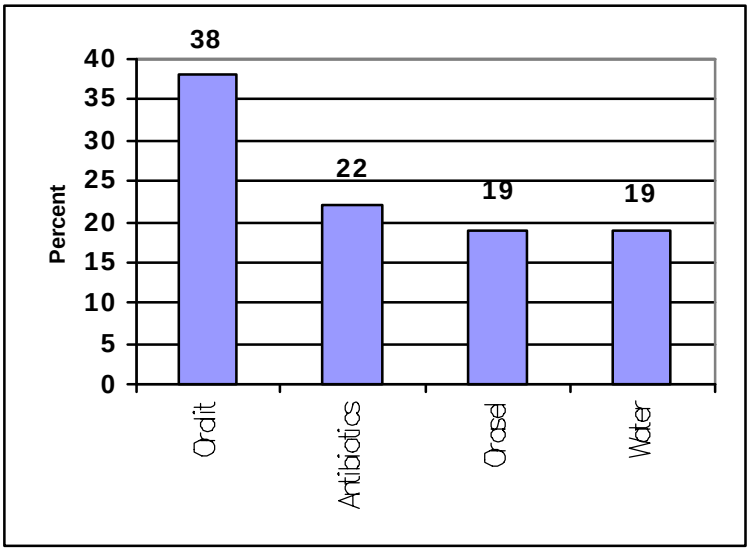
One vexing problem in treating diarrhea is the tradition of purchasing antibiotics for treating diarrhea. In April 2006, PSI with support from USAID and WHO, launched a pilot social marketing campaign for reformulated, improved diarrhea treatment kit (DTK) which was branded as *Orasel*. These kits contain two packs of low osmolarity ORS with 10 tablets of 20 mg. dispersible zinc supplements and a consumer insert containing information on correct use, danger signs, prevention, and messages on continued feeding. This is an innovative intervention in which PSI has partnered with a limited number of NGOs, including ARC and CRC, to pilot test the product in a limited geographic area. Although *Orasel* was only sold in 20 of the ICH Project's villages, the product was promoted throughout the project area as another local organization, RACHA, was involved with selling *Orasel* through local shopkeepers.

One key component of the project's distribution strategy is recruiting local shopkeepers, village drug sellers, and Red Cross volunteers to distribute the kits as an alternative to antibiotics for the treatment of diarrhea. These distributors, including the Red Cross volunteers, charge a small fee for the kits (approximately $0.36). Some of the profits go into a community fund that can be used for special needs such as funding emergency transportation costs for hospitalization.

The implementation of the *Orasel* kits began only three months prior to the MTE, and was being piloted in 20 villages, in collaboration with PSI. Despite the fact that it is a new intervention, it was identified by mothers as a treatment for diarrhea. (Refer to Chart 1, below.)

To assess progress in mothers' understanding of diarrhea treatment, the MTE team asked mothers what they would do if their child had diarrhea. Mothers were asked open-ended questions. Their answers were marked on a checklist of likely answers. Since diarrhea treatment involves a number of behaviors, the MTE team wanted to know the range of actions that mothers take. The results are presented in Chart 1, below.

Chart 1: Mothers Most Frequently Mentioned Treatment for Children's Diarrhea. N=288



The four most frequently mentioned actions are presented in this chart. Oralit is a package of oral rehydration salts procured by UNICEF. As stated above, *Orasel* is a diarrhea treatment kit that is marketed as an alternative to antibiotics.

In comparison to the findings in Chart 1, caregivers (58.7 percent) in the baseline survey reported that the most common treatment was a pill or syrup (likely to be antibiotics). Packaged oral rehydration salts

(ORS) was cited by nearly one-third; only 2 percent (two cases) reported making a sugar-salt solution in the home.

On the one hand, it was a positive indicator that the most frequently identified action in the MTE survey was the use/purchase of oral rehydration salts (Oralit). On the other hand, the fact that antibiotics were the second most frequently mentioned action implies that the use of antibiotic is still considered as a viable method of treatment.

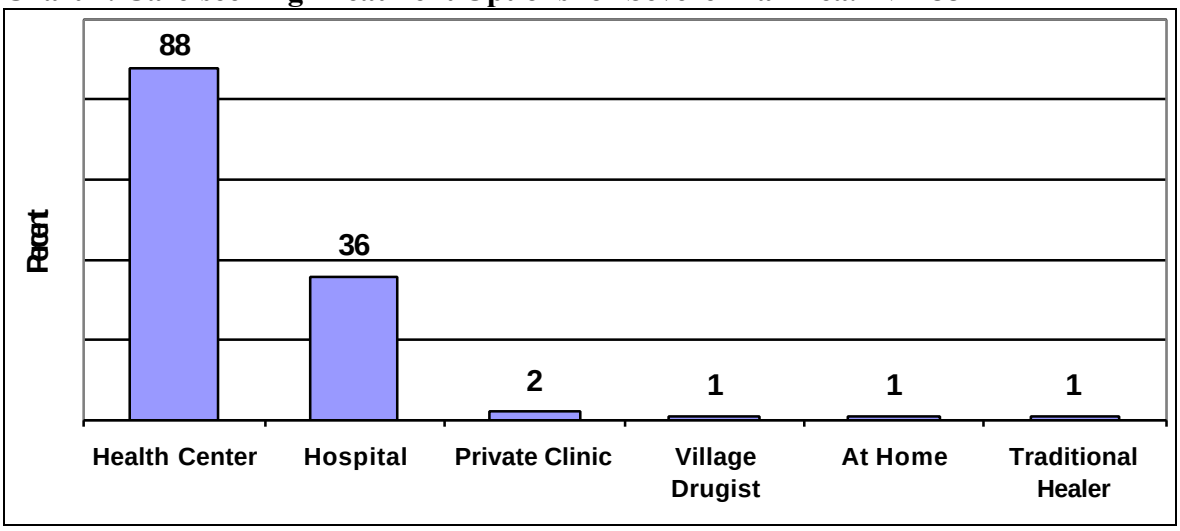
Also of interest is the fact that, unprompted, 19 percent of mothers report use of *Orasel* as a diarrhea care treatment. It is noteworthy to consider that this product and its promotion were non-existent four months prior to the MTE.

It is important to note that the responses recorded in Chart 1, above, have duplicate counts. Mothers could give more than one response to the interview question. The percentage of mothers who mentioned one or the other (Oralit or *Orasel*) was 47 percent. This finding does compare favorably to the baseline KPC finding of 33 percent of mothers reporting ORS use during their child's last diarrhea episode. The fact however, that less than 50 percent of mothers identified one or the other of the oral rehydration alternatives was an indicator that it may not yet be accepted by a majority of mothers. It should be clear to all mothers that oral rehydration solution, in one form or another, is an essential intervention.

Additional evidence of the uncertainty regarding diarrhea control was the mothers' ability to identify signs and severity of diarrhea and discriminate among other signs of illness. During the interview of mothers, they were shown a graphic that contained six pictures of signs of illness. The mothers were asked to point out which of the six pictures showed signs of diarrhea. More than 95 percent of them identified at least one sign. However less than 20 percent correctly identified all three signs and correctly rejected the three that were not danger signs of diarrhea.

Mothers were also asked where they took their child if that child had severe diarrhea. The question was open-ended and the responses were recorded on a checklist of likely responses. Chart 2 presents the findings.

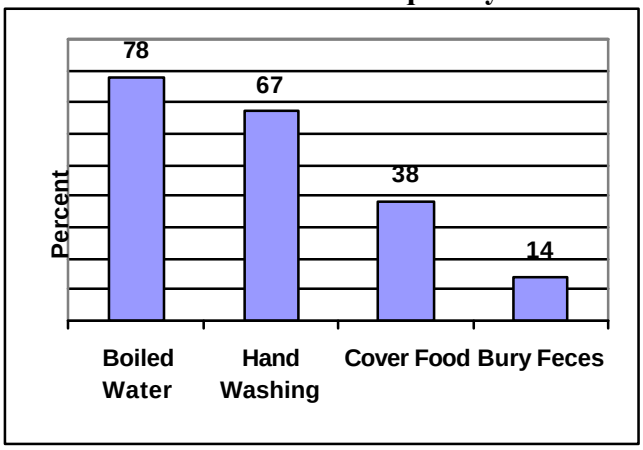
Chart 2: Care-seeking Treatment Options for Severe Diarrhea. N=288



The importance of the data in this chart is the contrast between the high proportion of mothers who chose the health center and those who chose the drug seller, traditional healer, or the option of doing nothing by staying at home. It is clear that mothers accept the role of the health center in treating severe diarrhea.

The MTE team also investigated prevention, another aspect of diarrhea control. As with the previous question, mothers were asked to state what could be done to prevent diarrhea. The MTE team wanted to know about mothers' awareness of the range of preventive behaviors. The following chart presents the most frequently mentioned behaviors.

Chart 3: Behaviors Most Frequently Identified for Preventing Diarrhea. N=288



As illustrated in this chart, boiling drinking water and washing hands were the most frequently mentioned behaviors. More than 95 percent of mothers identified at least one behavior and more than 75 percent mentioned at least two. This finding presents evidence that progress is being made in teaching diarrhea prevention.

The challenge in this topic is that preventing diarrhea requires a set of behaviors. It is good that so many mothers recognized the value of boiling water, but they also need to know about covering food from flies and burying feces. It is important that mothers understand the full set of behaviors that are needed to prevent childhood illnesses.

Summary on Diarrhea Control

The project team focused on this topic and nearly all of the mothers who were interviewed knew something about treatment and prevention. The areas where mothers' understanding was the strongest was in taking children with severe diarrhea to the health center, using boiled water, and washing hands to prevent its occurrence. Topics that need to be strengthened are the use of oral rehydration solutions and zinc supplements, not using antibiotics and understanding the whole set of behaviors needed to prevent diarrhea.

Recommendation. #2. The project team should be sure that the key messages about diarrhea treatment and prevention are well understood before proceeding to new interventions. The fact that the messages are widely diffused is not enough. There should be a goal that 80 percent or more of mothers identify oral rehydration solutions as an intervention for home treatment.

Note: There are implications in the above findings regarding the behavior change and communication strategy. A discussion and recommendations in this regard are presented in Section B.2.b.

Recommendation #3. Use of the *Orasel* diarrhea treatment kit should be expanded from its pilot phase to full implementation throughout the project area. Furthermore, this expansion process should be documented and shared with the MOH and the NGO community. It presents an alternative to the tradition of purchasing antibiotics for diarrhea treatment, and it contains a more effective rehydration solution than the current rehydration packet.

Integrated Management of the Sick Child: Malaria Control

Program Plan

The malaria control and prevention plan in the DIP included training of field officers as trainers and, in turn, they would train the Red Cross volunteers and village leaders in prevention, especially in the use of bed nets and in early treatment when a child shows signs of malaria. (Refer to Table 3, page 11 for a description of the work plan.) A foundation for this plan was a formative research study on beliefs and practices regarding malaria control.

In September 2005, the project team, along with the National Malaria Center, Provincial Health Department, and Operational Health District, conducted a formative research study to create messages that addressed existing beliefs and practices regarding malaria control.[2] The study findings, and recommendations were analyzed during a one-day workshop that resulted in the development of a joint malaria control action plan.

The action plan called for a setting up of a training program and for the implementation of two insecticide retreatment campaigns. The first campaign occurred on March 25 and 26, 2006. An important contribution made by the National Malaria Center was the donation of insecticide, valued at more than half of the total activity cost. It was held in twelve of the most vulnerable communities in Varin and Angkor Chum districts. The campaign resulted in the treatment of

1,702 bed nets, affecting approximately 3,900 people. (Refer to Attachment F: Special Reports for full report entitled *Insecticide Treatment Campaign: Activity Report, May 2006*.)

The second campaign was held on June 5 and 6, 2006. It resulted in the treatment of an additional 660 mosquito nets in five malaria-vulnerable villages of Angkor Chum and Varin. The total number of beneficiaries was 3,101. (Refer to Attachment G: Special Reports for a report on the second campaign, *Insecticide Treatment Campaign: Activity Report II*.)

MTE Findings

The MTE team interviewed mothers, Red Cross volunteers, and village leaders about malaria control knowledge and practice. Mothers were asked about the use of bed nets and the signs of malaria. Table 4, on the following page, presents the findings regarding the use of bed nets.

Table 4: Family use of bed nets. N=288

Variable	Response Rate
Families with children under five, with bed nets	83 percent
Bed nets treated with insecticide	18 percent
Children under five who slept under an insecticide-treated bed net	25 percent
Families with a pregnant woman	13 percent
Pregnant women who slept under an insecticide-treated bed net	67 percent

It is encouraging that 83 percent of the families had bed nets, but the challenge lies in that only 25 percent of children were reported to sleep under a treated bed net. The high percentage of pregnant women who slept under a treated net was likely due to the low number in the denominator. There were only 36 pregnant women out of the 288 women who were interviewed. Twenty four of the thirty-six slept under a treated net.

The project is in transition regarding its strategy for insecticide treatment of bed nets. An intervention that began just weeks before the MTE was the introduction of long-lasting insecticide-treated mosquito nets (LLINs). The ICH project received a donation of 10,000 LLINs from the International Federation of Red Cross and Red Crescent Societies (IFRC) and is the first project to use long-lasting technology in Cambodia. LLINs have been demonstrated to be effective at repelling mosquitoes for up to 21 washes. The project's educational materials were coordinated with PSI to ensure consistent messaging about the washing interval. The project team estimates that nets are washed no more than one time every three months. This is expected to give the LLIN a repellent life of four to five years. Working with the Operational District staff, the project members designed and targeted a segmented, four-point distribution scheme for the maximum impact:

- First, free nets will be provided to pregnant women completing two ante-natal care (ANC) visits or women giving birth at the health center (targeted by health center based on ANC attendance rates). This will not only increase ANC attendance, but also protect pregnant women and their unborn babies from malaria;

- Second, free nets will be given to very poor families with children under two years of age to ensure that all vulnerable children are protected from this deadly disease regardless of their family's income;

- Third, for those families that can afford to purchase bed nets, bed nets will be sold at reduced prices in the village to improve access and availability of bed nets to families with children less than two years of age. This sale of bed nets will further benefit the community as the income will be used by the village in which the nets are sold to promote health activities.

- Fourth, one free mosquito net will be given to all active village leaders, village health support group members, and Cambodian Red Cross volunteers in recognition of their valuable contribution in improving the health of other community members.

An introductory launch was held in June 2006 in which some Red Cross volunteers were given LLINs. In addition to Red Cross volunteers and community members, representatives from the USAID mission, the national CRC office, the provincial governor, and provincial health officials attended the launch. The project staff will continue training volunteers and distributing the nets following the MTE.

Given the high percentage of families that have bed nets, there should be no significant barriers to the acceptance of these nets. These nets eliminate the need and cash costs related to re-treatment of nets with a new dose of insecticide every six months. Furthermore, long-lasting nets will continue to protect users long after the end of the project. The project team is well aware of the urgency to distribute these nets and has plans to continue their distribution as soon as the MTE is completed.

During the MTE mothers were also asked to identify signs of malaria. As with signs of diarrhea, mothers were shown a graphic with six pictures of childhood illnesses. The graphic contained four pictures with signs of malaria, and two with other illnesses. As with the diarrhea graphic, the pictures were taken from the project's IEC materials. Mothers were asked to point to those that indicated malaria and those that did not. Nearly 100 percent of the mothers pointed to one sign and more than 80 percent pointed out two. This compares to the baseline survey where 27.4 percent of mothers were not able to identify any danger signs for any illness. On the other hand, less than 20 percent correctly identified the four pictures that were correct and the two that were not signs of malaria.

In support of the findings regarding mothers' knowledge of danger signs, the Red Cross volunteers stated that of all the health topics, mothers understood malaria control the best.

Additionally when village leaders were asked in which topics they had received training, 52 percent stated malaria. This was the most frequently identified topic by the village leaders.

Summary of Malaria Control

The fact that more than 80 percent of mothers could identify at least two signs of malaria is a good indicator of progress. Additionally the fact that more than 80 percent of the families have bed nets indicates that there is a strong acceptance of their use. These nets eliminate the complication of having to periodically treat nets with a new dose of insecticide. The investment that the project has made in the long-lasting nets is solid.

Recommendation#4. The ICH Project leaders should roll out the LLINs to cover all the malaria-endemic areas. This model should be documented, published, and disseminated throughout the health community. These nets overcome the need to retreat bed nets every few months and can make a signification contribution to reducing the incidence of malaria, especially in children and pregnant women.

Although taking advantage of the technological advance shown in the long-lasting bed nets is a step forward, the challenge lies in families adopting the behavior of having their children actually sleep under these nets. This report contains recommendations regarding the behavior change and communications strategy for malaria control. Since these recommendations apply to all the interventions, they are presented in section B.2.b, Communication for Behavior Change.

Nutrition Intervention

Program Plan

The plan for the nutrition intervention was to strengthen the referral to the health center for prenatal care (which includes receiving nutritional supplements), implement community-based growth monitoring, and promote exclusive breastfeeding and complementary feeding of children ages 7 to 23 months.

The nutrition intervention began with promoting referrals for prenatal care. The growth monitoring intervention was initiated just two months prior to the MTE. A pilot test of the growth monitoring procedures was done in conjunction with a vaccination outreach session. The plan is to expand growth monitoring after the MTE. Exclusive breastfeeding and complimentary feeding were not scheduled to be implemented until after the MTE. The plan is to begin the exclusive breastfeeding intervention in October 2006.

MTE Findings

To assess progress in making referrals for prenatal care, the MTE team obtained data from the health centers in the target area. Data was obtained from 12 of the total of 15 centers in the 3 districts. The interviewers requested data on the number of women seen for prenatal care in January 2006 and July 2006. Table 5 page presents the findings.

Table 5: Comparison of Prenatal Care in January and July 2006. N= 12 health centers.

	January 2006	July 2006	Number Increase	Percent Increase
Number of pregnant women	1,029	1,204	175	17 percent

Ten of the twelve centers had an increase of prenatal care visits between January and July and five of these had an increase of 23 percent or more. Although the increase in prenatal care consultations cannot be attributed solely to the project, these findings do indicate that the promotion of prenatal care in the project area has made a positive contribution.

One factor in the number of women served is the RACHA family planning program, implemented in collaboration with the health centers. This program's effect can be seen in the data in Table 4. Out of 288 households that were interviewed, only 36 included a pregnant woman. In addition, during field interviews the lead evaluator asked the Red Cross volunteers that he visited to show their registries of women in their care. The typical range of pregnant women was zero to two. When asked why so few women of childbearing age were pregnant, the Red Cross volunteers stated that many women were using birth control. They reported that the health center staff was promoting this intervention.

Red Cross volunteers have begun to include growth monitoring and basic nutrition information in health center outreach sessions in the village. However, this is not being done consistently in all villages. Several issues have limited the roll-out of this intervention including: 1) the perception among health center outreach project team members that growth monitoring is done only twice per year (during the vitamin A and mebendozole campaigns in November and April), 2) a lack of understanding among volunteer care group leaders that they are responsible for coordinating this activity every month, and 3) the field officers were trained in this only two months prior to the MTE. Furthermore, the onset of rice planting season in July has also limited volunteer participation during the month prior to the MTE.

Finally, with the introduction of the MOH immunization fixed-site strategy, not all villages are receiving an outreach visit from the health center. Therefore, an alternative growth monitoring strategy (not linked to health center outreach) needs to be developed for these villages.

Summary of Nutrition Intervention

The project has promoted prenatal care and indications are that this emphasis has contributed to an increase in the promotion of prenatal care in this area, including technical training and initiation of field activities related to prenatal care, health center referral, growth monitoring and basic nutrition. Health center data indicates that the project has contributed to an increase in the number of mothers seeking antenatal care. The initiation of the additional nutritional interventions should be delayed as per recommendation #5, below.

Recommendation #5. The plan is to initiate exclusive breastfeeding soon after the MTE is completed. Before doing so, the project team should first develop and implement participatory learning methods as described later in the report in Section B.2.b. Behavior Change and Communications. It will take time to train the field officers in participatory learning skills and they, in turn, will need time to train the Red Cross volunteers and the CVCG leaders. Thus the project leaders should revise their implementation schedule accordingly. It will delay rolling out the remaining interventions, but these changes will make the project team more effective when the new interventions are introduced. This is especially important in regard to promoting exclusive breastfeeding because of the ingrained tradition of giving infants supplements of water, tea, and rice water.

Recommendation #6. An alternative growth monitoring strategy (not linked to health center outreach) needs to be developed in collaboration with the MOH, for villages that are no longer targeted for vaccination outreach due to the expansion of the fixed-site strategy.

2. Cross-cutting approaches

a. Community Mobilization Program Plan

This project has two components in community mobilization: mobilization for participation with the health centers and mobilization of care groups in the targeted villages. This section will address participation with the health centers. Care groups will be addressed in section B.2.c.iv. later in this report.

The plan for mobilizing participation with the health centers involves village leaders, Village Health Support Group (VHSG) leaders, CVCG leaders and their respective Red Cross volunteers. One of their tasks is to organize mothers for monthly vaccination sessions in the village. Additionally the project supports the monthly meetings at the health center by covering the transportation costs for the attendees. These meetings include village leaders, VHSG leaders, Red Cross volunteers and field officers.

The recent expansion of the health center fixed-site strategy provides vaccination services for villages that are close to the health center. Monthly VHSG meetings have become essential to monitor vaccination coverage rates and coordinate follow-up with mothers in villages no longer receiving outreach visits.

MTE Findings

In the interviews with 12 of the 15 health centers, the MTE team collected data regarding attendance at the monthly outreach planning meetings. The health center data showed that 93 percent of the villages in their respective catchment areas were represented in the meetings in July 2006. Ten of the twelve health centers had 100 percent of their villages represented, and one center had one village not represented because of flooding. There were attendance problems in the catchment area of only one health center. It is important to note however, that this center is in the process of implementing the fixed-site strategy for vaccinations. Additionally as reported in Section B.1.b. (immunization intervention) all health centers except one reached 100

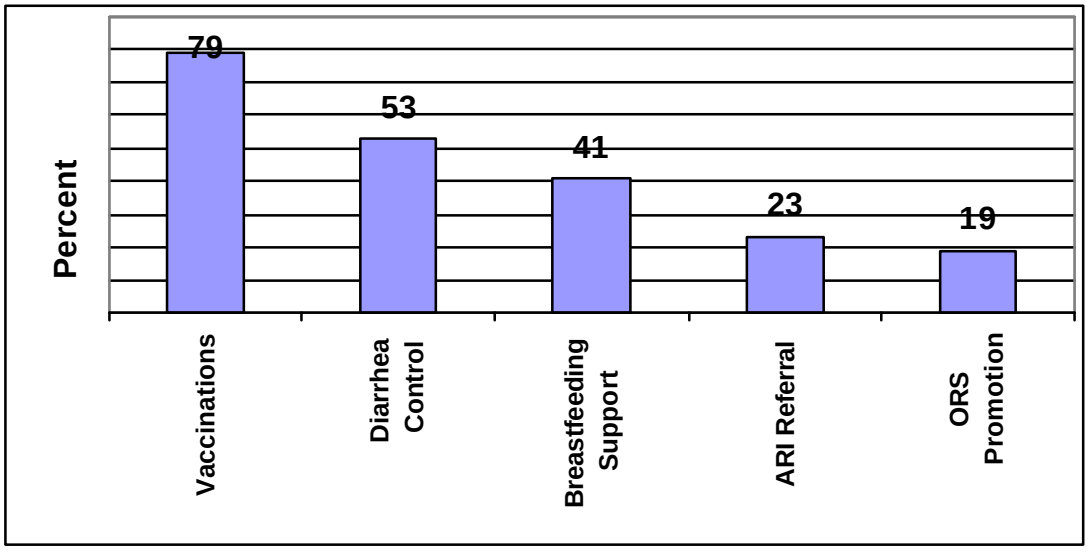
percent of the targeted villages in their catchment area with a vaccination campaign in the previous month.

One component of the project was the attendance of the field officers at the health center monthly meetings. Health center staff members were asked if the project's field officers participated in the last monthly planning meeting. Four of the twelve centers reported that the field officer did not attend. It is understandable that occasionally an officer will have a scheduling conflict; however, it is a matter of concern that four of twelve did not attend. This problem will be addressed in section B.2.c.i.later in this report on strengthening the grantee organization.

Village leaders in turn were asked about their participation in the monthly meetings at the health center. A total of 90 village leaders were interviewed. When asked if they participated in the vaccination outreach session in the previous month, 76 percent stated that they had done so. When asked if they attended the monthly planning meeting at the health center in the previous month, 60 percent reported having attended. The discrepancy between the attendance figures from the health centers and the leaders is because villages have at least three types of leaders who can represent the villages: the elected village leader, two VHSG leaders, and the CVCG group leader. This actually is a strength for the villages because the leadership in health care does not fall on one person alone.

Village leaders were asked about the health center activities that they supported in their villages. The following chart presents a record of the range activities.

Chart 4: Village Leaders' Activities with Health Center Staff. N=90 leaders.



Although organizing the community for vaccinations is a predominate function of the leaders, it is encouraging to see the wide range of other activities that they support. The relatively high number who stated breastfeeding is likely the result of the efforts of the health centers and other

NGOs such as RACHA. It is evidence that there are resource people within the health centers and villages who can support breastfeeding activities when this activity is rolled out.

Another indicator of the strength of community mobilization is the leaders' collaboration with other NGOs. When asked if they met with an NGO in the last month (other than the Red Cross), 82 percent stated that they did so. In addition, they averaged meeting with nearly three different NGOs in that month. This is an indicator of the amount of activity in community development.

These findings give evidence of very active communities. The wide range of activities and the high proportion of village leaders who are involved give the project a solid foundation in mobilizing support for the project's interventions.

Summary of Community Mobilization

Mobilization of the health community is part of the project's fourth strategic objective. The findings from the MTE show that the health centers are consistent in outreach to the community and that village leaders are very active in a wide range of health and community development activities. There is a strong foundation of community mobilization.

Recommendation #7. The project team should take advantage of this level of leadership involvement by including the village leaders in the behavior change and communication strategy. This does not necessarily mean that they should receive the same training as the Red Cross volunteers. Rather village leaders can be enlisted to participate in monthly reporting meetings including review of the community-based surveillance system, community events, informational meetings, and kick-off events. The project's communication strategy should include them as human resources or communication channels for the diffusion of the health messages. (Refer to the framework for a communication strategy)

b. Communication for Behavior Change

The project has conducted two formative research studies for the purpose of refining its communication strategy for immunizations and insecticide-treated bed nets. (Note: these studies have been described in the sections on immunization and malaria interventions previously in this document and can be found in Attachment F: Special Reports.)

Additionally, two months prior to the MTE, the ICH project hired a BCC team. The team is composed of one social marketing officer, one communications officer, one Volunteer Services Overseas technical advisor, and one BCC manager.

In June, the MCH technical advisor and project coordinator organized a two-day introductory BCC training. As part of that training, the BCC team decided to focus its first technical area on hand-washing promotion. Since that training, the BCC team completed a hand-washing barriers and benefits assessment and designed a participatory community activity scheduled to launch in September 2006.

The project also sponsored successful campaigns for retreating bed nets with insecticide in the Varin and Angkor Chum Districts. The project also has begun implementation of its LLIN targeted and segmented distribution strategy. An innovative IEC tool for promoting these bed nets is a voucher given to families who receive one of these nets. Along with information about proper use and care of the net is a place on the voucher for the recipient to sign that he or she will give priority use to pregnant women and children under two years of ages and will not sell the net. As already stated, there is evidence of good progress in these interventions. LLIN beneficiaries are also given a sticker with the priority messages on use and care.

IEC materials used for training the Red Cross volunteers and for communicating health messages to the mothers are another component. These materials are attractive, culturally appropriate, and based on pictures rather than text. The data from the Red Cross volunteer interviews (N=242) showed that 95 percent of them used these materials when teaching mothers. When the lead evaluator interviewed Red Cross volunteers, they were able to describe the messages and use of materials without hesitation and with confidence.

The project does have some elements in place of a behavior change strategy. The IEC materials are well-designed, and their development included participation and input from the provincial health department and operational health district technical project team. Field officers, however use only lectures as the delivery method for this information. Aside from stickers produced that promote the proper use and care of long-lasting bed nets, these are the only materials used by the project. Mothers, volunteers, and village leaders need to be engaged in a dialogue to discuss improved health practices and decision making to achieve behavior change. The communications strategy needs to be interactive and include methods such as demonstration, games, and guided group discussions. Motivational interviewing also should be explored as a viable method. Furthermore, the project needs to have a systematic approach that integrates social marketing and behavior change and that can be adapted tothe learner's level of experience and knowledge.

An example of such a strategy is presented in Table 6. (Note: this framework is an adaptation of the Transtheoretical Model for social change.[3])

Table 6: Suggested Framework for a Communications Strategy.

Communication Stage	Media
Awareness Building Stage (Broadcast the behavior change messages to build awareness.)	⇒ Radio spots ⇒ IEC materials ⇒ Posters, leaflets ⇒Puppet shows
Preparation Stage (Prepare learners by modeling the behavior change so they can see how it is done; prepare by answering "how-to" questions)	⇒Role plays (modeling how to) ⇒Demonstrations ⇒Small group discussions of advantages and disadvantages of adopting a new behavior
Action Stage (Help learners make and follow through	⇒Participatory learning methods that engage learners in making decisions (as opposed to telling people

behavior change decisions.)	what to do)
Maintenance Stage (Communications that help learners maintain behavior change; provide incentives to continue.)	⇒Testimonials of people who have experienced the benefits of changed behavior ⇒Rewards for behavior change – e.g., giving a flag for to a community having that achieved an immunization goal. ⇒Individual recognition – stickers on yellow cards, picture to put on walls, etc.

A fundamental assumption in this framework is that learners are at different stages in their readiness to change behavior. For example, some people may not be aware of the behavior change message while others are interested and are ready to learn more. An additional factor is that people need to hear a message multiple times, from different means, before making a lasting change. Thus communications need to fit their stage of readiness to change.

Note that these stages are overlapping; not everyone is at the same stage of readiness to change. Awareness building communication can be broadcasted while role plays and demonstrations from the preparation stage are going on.

An example of how this framework could be implemented follows.

Example of a Comprehensive Behavior Change and Communication Plan

Using the long-lasting bed nets as an example, a communications strategy could build awareness through kick-off events (which the project has already initiated), posters, puppet shows, and radio spots.

Preparation events could include discussions led by the Red Cross volunteers on the advantages and disadvantages of the long-lasting nets and a community drama showing the thinking process that someone goes through in choosing to use the net. It could also illustrate the decision-making process involved in giving priority to young children.

The basis of the action stage is using participatory learning methods for helping learners make decisions. IEC materials can be used to facilitate discussion and personal decision-making.

The maintenance stage could include an incentive program where families could "earn" a colorful picture to hang up in their homes. The project staff and the village leaders could set goals for the percentage of homes with treated nets and award a flag to the communities that reached their goal.

Recommendation #8. The project team should develop participatory methods and organize training to facilitate adult learning. Acquiring facilitation skills could be a challenge for the field officers who have a teaching background, so it will be important to not underestimate the importance of this training.

Recommendation #9. The project team should adopt a BCC strategy that integrates social marketing and behavior change, as illustrated in Table 6, above. There are numerous evidence-based communication and behavior change models; the one in Table 6 is one possibility. The project team should adopt either this one or another of its choosing and use it to structure their BCC strategy.

c. Capacity-building Approach

Strengthening the Grantee Organization

The grantee is the American Red Cross; the Cambodian Red Cross is a sub-grantee and is the implementing partner of the ARC. This is the first child survival grant managed by the CRC. The organizational structure includes four ARC technical staff members who serve as mentors and counterparts for the CRC staff and are based at the project site. These staff members hold key technical positions (project coordinator, monitoring and evaluation technical officer, training officer, and the ARC project officer).

Traditionally, Red Cross volunteers work in disaster relief in Cambodia (as well as many other developing countries). The CRC, however, has made health a priority area in its strategic plan. It includes using health volunteers with training in areas such as HIV/AIDS, maternal and child health and, in the case of this project, child survival.

The large number of volunteers recruited for the ICH project (nearly 2,000) has raised some concerns among CRC leadership as this represents 25 percent of all CRC volunteers across Cambodia. However, as the ICH project succeeds in achieving its goal and objectives, and the CRC experiences firsthand the effectiveness and strengths of the volunteer care group model, it is possible that this model becomes accepted as a best practice. This organizational realization would particularly benefit the CRC as a voluntary service organization because voluntary service is a fundamental principle of the Red Cross. Additionally, use of best practices and industry standards will make the CRC more competitive to attract future funding for similar community health projects.

Areas where the CRC has been strengthened are: the technical capacity of staff and Red Cross volunteers in immunization, diarrhea control and malaria control; skills in health communication; linkages with the MOH; and the establishment of an operational monitoring and evaluation system.

There is a good working relationship based on mutual respect among the CRC branch director, the CRC project manager, and the ARC project officer. This relationship has facilitated the work of the project and strengthening CRC's understanding and acceptance of issues relating to compliance with USAID rules and regulations. Together, they have analyzed project management issues and worked towards defining solutions to improve the project's activities in the field. The branch director has assumed increased ownership and responsibility for project management. He fully participated in all stages of the MTE process, including a pre-MTE briefing session, planning workshop, field level data collection, data entry, analysis and action planning, and a final debriefing session at the CRC Headquarters in Phnom Penh. Gradually the CRC Branch office has grown from thinking of the child survival Red Cross volunteers as belonging only to the project to thinking of them as CRC volunteers.

The ARC and other Federation partners such as the Danish Red Cross have assisted the CRC Siem Reap Branch office in establishing financial systems. These systems are now in place. An important result is that the provincial office manages the payroll and pays the bills efficiently.

The national CRC office has a new general secretary. She attended the MTE briefing at the end of the field work and affirmed her vision of CRC as an agency that is committed to supporting health volunteers with a range of skills, including child survival. The major challenge for the national office is that of identifying barriers in the financial management systems for transmitting project funds to the provincial office on a timely basis. To address this problem, the ARC Asia/Pacific regional director met with the CRC senior leadership. They agreed to work on the basis of a quarterly advance of funds from the ARC to the CRC to overcome the problem of the six-week lag in the transfer from the national office to the branch office in Siem Reap.

The project experienced a major constraint in the delay in signing the cooperative agreement. The project team, nevertheless, has progressed rapidly in implementing the interventions and activities in the DIP. It is crucial, however, that the project stays on course with the plan in the DIP. There is no leeway for adding new training and interventions.

Recommendation # 10. The project team must adhere to the work plan in the DIP and resist introducing additional interventions and activities. Because of the delay in signing the cooperative agreement, it is urgent that the project focus on completing the plan that is in its agreement with USAID.

Another challenge for CRC's capacity is sustainability of the project. This matter will be addressed in the sustainability section below.

Strengthening Local Partner Organizations

The key local partners are the health centers in each district. Additional primary partners have included the Provincial Health Department, Operational District, Reproductive and Child Health Alliance (RACHA), PSI, and the National Malaria Center. The capacity of the MOH staff has been strengthened by participating in the two formative research projects and in the technical training for the child survival interventions. The project leaders have done a good job of including health center and district health staff in each step of the project. This is especially true in the formative research projects. These experiences contributed to improving their analytical skills and appreciation for evidence-based practice. As a result there is a strong sense of partnership between the project and the MOH.

Another aspect of partnerships is relatively high level of involvement of other NGOs that was reported earlier in the section on community mobilization. The fact that village leaders report working with an average of nearly three NGO implies that there is a lot of communication and coordination among them. This creates good synergy for each other's work. The most frequently mentioned NGOs were as follows:

- Reproductive and Child Health Alliance (local NGO) for its work in family planning;

- Caritas for its nutrition program with WFP support in food-insecure areas, its school feeding programs, and a home-based care program for people living with HIV/AIDS;
- Adventist Development and Relief Agency for its work in water and sanitation;
- Belgian Technical Cooperation Agency for supporting the development of the MOH's health infrastructure and supporting access to secondary and tertiary care for people who cannot afford it;
- PSI for its work in marketing the diarrhea treatment kits. A tripartite letter of understanding has been signed among PSI, ARC, and CRC to collaborate on work on the DTK.

Health Facilities Strengthening

Although the ICH Project does not include contributions of equipment, it does assist in improving the capacity of the health center facilities. The contributions of this project to strengthening health facilities are in four areas. First, MOH staff members (national level, PHD, OD, and health center) are consistently involved in project training, field activities, and monitoring, and evaluation. The C-IMCI training curriculum is always reviewed with appropriate technical staff from the PHD and OD. Together, with the ICH technical training officer, they refine each training curriculum. This process involves integration of participatory training approaches and the strengthening of the MOH staff members' capacity.

Health center staff members were actively involved in field work for both insecticide treatment campaigns. Additionally, OD and the health centers participate in routine monitoring of project activities as well as project surveys (baseline, malaria evaluation, and diarrhea evaluation). Finally, the research projects on immunization and malaria further evidence MOH collaboration and staff capacity building as part of the ICH project. (Refer to Attachment F: Special Reports.) The staff at the health facilities benefited from the knowledge gained from the studies and from being a full participant in the action plan that came out of the studies. The most tangible evidence of this collaboration is the evidence of increased childhood vaccinations (refer to Section B.1.b).

Second, the community-based surveillance system (CBSS) has been developed in close collaboration with the OD staff. This system is enabling the OD and health centers to monitor suspected cases of diarrhea, malaria, and respiratory infections, as reported by Red Cross volunteers. This information will enable the health center staff to better respond to epidemics and to target high disease prevalence communities. (For more information, see Section C.7. Information Management)

Third, the OD and health center staff will participate in distribution of long-lasting mosquito nets to women attending ante-natal care sessions or those giving birth at the health center. This collaboration strengthens the service delivery package offered by the health center while demonstrating an alternative approach to mosquito net distribution to the National Malaria Center (CNM). At present, the CNM's preferred distribution method is to conduct a distribution campaign and exhaust the entire stock of mosquito nets.

The fourth area where health facilities have been strengthened is in the relationship with the community. In addition to promoting improved preventive practices, Red Cross volunteers are responsible for mobilizing communities to attend health center outreach sessions, supporting growth monitoring during those session and referral of severe illness cases to the health centers. (Refer to the nutrition intervention section). In addition, the ICH Project supports the vaccination fixed-site strategy at four health centers

An indirect contribution has been in strengthening community mobilization. As discussed in Section B.2.a, this is an area of strength for the project. The benefit to health facilities is that it increases community participation both at the health centers and when the health center staff members conduct outreach programs.

Strengthening Health Worker Performance

The project adopted World Relief's care group model for CVCG health volunteers and also incorporated elements from the IFRC's African Red Cross Health Initiative.[5] In this model, Red Cross volunteers from each village are organized into groups of 10 with a CVCG leader who serves as a coach and mentor. The Red Cross volunteers are trained and meet as a group to discuss issues such as monitoring and reporting. Each CVCG is assigned to complete home visits to promote and negotiate improved health practices with to up to 20 households. This means that Red Cross volunteers are recruited in proportion to the population as opposed to recruiting a certain number per village. Out of these 20 households, they are asked to visit the households with children under five years old twice a month.

In addition, in each village there is a village health support group (VHSG) made up of two representatives from the village. Their primary role is to serve as the communication link between the village and the health center. One of the group's main functions in this respect is meeting with the health center staff to schedule and coordinate vaccination outreach sessions.

The care group model has been functioning for nine months and still needs to develop the role of the CVCG leader. Interviews with the project staff revealed that there is not a consistent understanding of this role and how it differs from the role of the Red Cross volunteers who are members of the care group. A contributing factor is that there is no specialized training for CVCG leaders. The field officers have not given them training that is different from that of the volunteers. The one role of the CVCG leader that was consistently identified was that of collecting monthly health monitoring data. It is important that the field officers have a comprehensive understanding of the CVCG leader's role and responsibilities so that they can communicate and support that role in their daily field work.

As a counter balance to this finding, however, are the findings from the MTE interviews with Red Cross volunteers. A total of 242 volunteers were interviewed and 92 percent stated that they had been visited by the CVCG leader one or more times in the last month. This is consistent with the mentoring and supportive role of the leader. On the other hand when the Red Cross volunteers were asked who trained them, 99 percent identified the field officers but only 6 percent identified the CVCG leader. Training is an important leadership role and, according to

the DIP, training should be a shared responsibility between the field officers and the CVCG leaders. The volunteers, however, do not identify the leaders in the role of trainer.

Thus the leadership role of the CVCG leader is still being developed. One potential resource for strengthening the CVCG leadership role is the community surveillance system (refer to Section C.7). This system will be rolled out following the MTE and it will involve the leaders in data collection, analysis, and planning.

It is important for this role to be strengthened since the care group model is a fundamental component of the sustainability plan.

Recommendation # 11. The leadership role of the CVCG leaders needs to be explicitly defined and understood by all project and health center staff and, in turn, by the Red Cross volunteers and the CVCG leaders themselves. The project should include some additional leadership skills training for the leaders, including skills in supportive coaching, motivational interviewing, and group facilitation.

Recommendation #12. The CVCG leaders should be jointly responsible for training the CVCG members. Currently they are just participants in the training done by the field officers. In the Cambodian culture, a teacher has high social status. If the CVCG leader is regarded by the CVCG members as a teacher, this perception will greatly strengthen his or her leadership status. In a previous recommendation it was stated that the field officers needed to learn facilitation skills. This training should include skills coaching and mentoring of the CVCG leaders as adult educators.

Another important element of the volunteer group model is the volunteers themselves. The ICH project has an ambitious task of maintaining a cadre of nearly 2,000 volunteers. A positive sign of success is that thus far the dropout rate (since volunteer recruitment) is only 4 percent. When considering that in many projects a rate of 10 percent is considered good, this is an excellent finding. This finding is highly significant considering that, outside of IEC materials and village-based training, Red Cross volunteers and CVCG leaders did not receive any benefit or incentive for the first six months of service. Decision making on the incentive scheme was delayed for this time due to a thorough debate and consensus building among key stakeholders on the most appropriate incentive scheme for the project.

The incentive scheme that came out of this deliberation was a non-cash, performance-based scheme that included a modest snack (e.g., fruit) during village-based training and information sharing meetings, tee-shirts and caps, LLINs, iodized salt, volunteer ID cards, sarongs, nail clippers, and soap as well as bicycles for volunteer leaders.

In spite of the established incentive policy, the issue of incentives arose during the MTE. When the lead evaluator interviewed field officers, a few recommended that the Red Cross volunteers receive a cash stipend for their attendance instead of snacks. In addition, during the field interviews in the Varin District this issue arose again. Some Red Cross volunteers reported that

they received cash instead of fruit as an incentive. Cash incentives were given because other NGOs who work in the areas have given cash to their volunteers.

It is the policy of the ICH project to not give cash as an incentive. This indeed is the correct policy. The values behind this policy were discussed during the MTE planning workshop. The lead evaluator facilitated a discussion on the nature of incentives for volunteers and the destructive effect of cash handouts. The project leaders should make it clear again to all field staff and Red Cross volunteers that cash cannot be given as an incentive.

The MTE team interviewed the Red Cross volunteers to assess their recall of the training that they had received. The table on the following page presents the results.

Table 7: Red Cross Volunteers' Recall Regarding Training Topics. N=242.

Topics	Frequency of Response
Malaria control	99%
Diarrhea control and/or hand washing	99%
Immunization and/or vaccination card	90%
Roles and responsibilities	25%
Seven fundamental principles of the Red Cross	24%

The recall of the Red Cross volunteers corresponds to the child survival interventions in which they have been trained. Their level of recall indicates that these are important to the volunteers and that they have been involved in the interventions.

One intervention that was rarely mentioned was growth monitoring; however the village-based training in this topic only began in the month prior to the MTE.

The project team did place a strong emphasis on the training regarding roles and responsibilities of Red Cross volunteers and the seven fundamental principles of the International Movement. The low frequency of recall in these topics is likely due to the abstract content and to the lecture training format. An additional factor is that there are no IEC materials on these topics. It is also possible that Red Cross volunteers did not perceive the volunteer contest focusing on roles and responsibilities as a training activity.

Recommendation # 13. The project team should repeat the training on roles and responsibilities and the seven fundamental principles, but use participatory methods and IEC materials. The CRC Siem Reap Branch should participate in the training and in the development of IEC materials. The branch office in turn, could make this a model that can be used by other CRC branch offices throughout the country. These topics are crucial for the project's sustainability.

Another factor in the capacity strengthening of the Red Cross volunteers is the amount of training that they receive. They were asked to recall how many times they were trained in the last month. Table 8, below, portrays the findings.

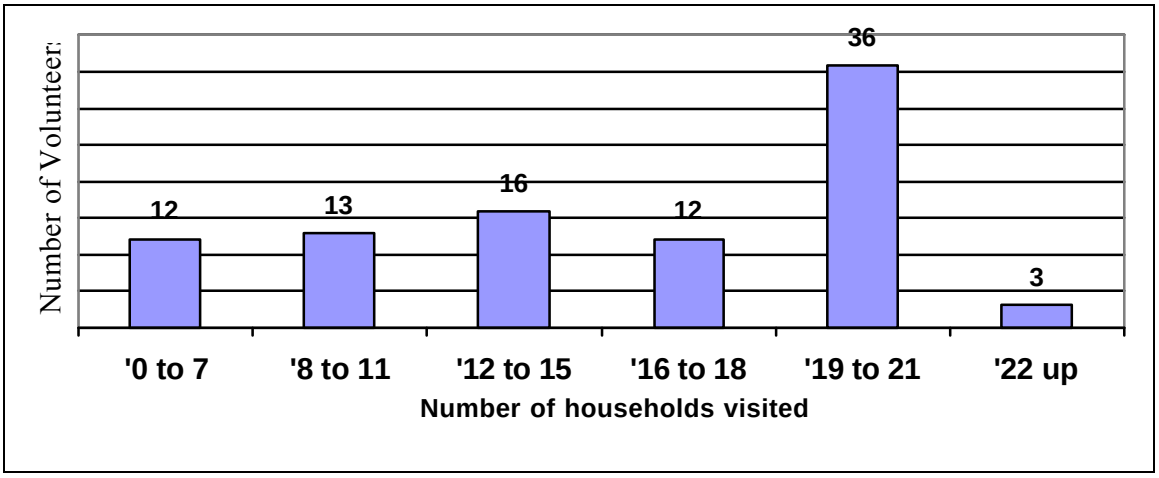
Table 8: Red Cross Volunteers' Recall Regarding Number of Times Trained in the Last Month. N=242.

Number of Times	Frequency of Response
None	6%
One time	89%
Two times	5%

The expectation is that the field officers meet with the care groups twice a month--once for training and once to discuss monitoring and evaluation matters. The data from the Red Cross volunteers indicate that the vast majority are being trained, which is one reason why the drop-out rate is so low. A factor in the 6 percent who stated that they were not trained is that this is the season for transplanting rice and the work load makes it hard for some to leave their field chores to attend training sessions.

An area that needs to be strengthened is the role of the volunteers in doing home visits for training and support of child survival interventions. The volunteers were asked to state how many households they visited in the last month. The following chart presents the findings.

Chart 5: Number of Households Visited by Red Cross Volunteers in the Last Month. N=242



It is evident that a high proportion of the Red Cross volunteers are not visiting all of the households under their supervision. Given that volunteers are assigned to an average of 20 households, only 39 percent reached all of their households (20 or more) in the last month. This finding should take into consideration the high workload required in transplanting rice in their fields for the month in question as well as the fact that the volunteers groups have been operational for six months. However, in order for the project to reach its full potential, the data demonstrates the need for improvement.

These findings are supported by a study that was led by the monitoring and evaluation officer. In an analysis of home visit data between February and May 2006, it was found that only 17 percent of the households had received the targeted rate of two visits per month during the reporting

period. The methodology was different from the one used in the MTE, but the findings show the same pattern as the MTE findings--that all households are not being visited monthly.

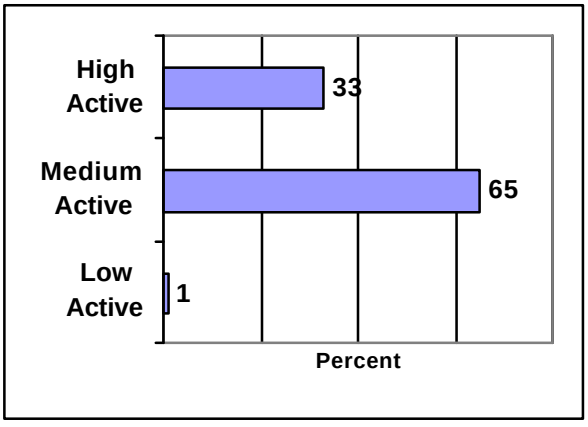
One issue that the project team needs to study is the relationship between the Red Cross volunteers' responsibilities and the amount of volunteer time that the volunteers donate to the project. The expectation is that they donate 12 hours a month. The 12 hours, however, are not enough when they are expected to attend two care group meetings a month (for training and monitoring), make 40 home visits (visit each household twice a month), and do household follow-up such as visiting a child with diarrhea within two days of the incident.

Recommendation #14. The project leaders should carefully analyze the time commitments that are requested of the Red Cross volunteers to make sure that they are not being asked to commit more than the agreed-on 12 hours. They should consider for example, changing the monthly number of household visits from two to one per month.

Recommendation #15. The project team, CVCG leaders, and the VHSG should join in setting a goal and target date for when all households receive monthly visits. They then should work together to help the Red Cross volunteers reach these goals. An incentive program could be included where the *whole community* is recognized for training and support of all targeted households. It is important that the efforts to increase the household visit rate be done in all positive way to ensure community support and buy-in.

The Red Cross volunteers appear to be well-accepted by the village leaders. Village leaders were asked to rate the level of activity of the volunteers. The following chart presents their assessment.

Chart 6: Village Leaders' Assessment of Red Cross Volunteers' Activity in the Village. N=90

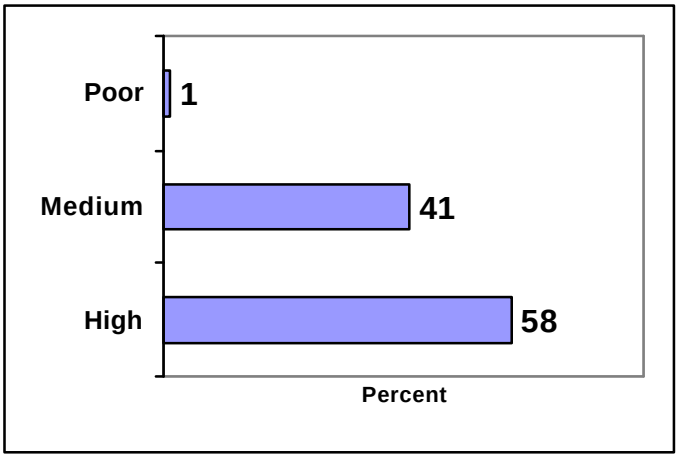


This chart presents a strong indication of the involvement of the Red Cross volunteers in the community. The data supports the findings in the community mobilization section. Given that the leaders' primary involvement is in organizing people for vaccination outreach sessions, the data imply that the volunteers and the village leaders work together in this area. The sense of working together may be another factor in the low dropout rate.

Finally the MTE inquired about the Red Cross volunteers' job satisfaction. They were asked to rate how they liked their work on a three-point scale.

Chart 7 shows that nearly 60 percent of the Red Cross volunteers gave the highest rating for their job, while only 1 percent stated dissatisfaction. These findings provide another insight into the reasons for the low dropout rate.

Chart 7: Red Cross Volunteers' Job Satisfaction rating **N=242**



One factor in the high satisfaction rate was an innovative event for engaging the volunteers in reflecting on their work as volunteers. The project staff conducted a volunteer contest where each volunteer group at the village level was asked to identify and explore why they decided to volunteer. The response from this contest was that high volunteer retention rate is attributed to a range of factors including:

- Interest in serving their community and improving child health,
- Interest in learning about health and nutrition through village-based training,
- Volunteers were elected by popular vote in a public community meeting, making them accountable to their communities,
- Membership to a well-known organization, the Cambodian Red Cross, which has a daily television news program that focuses mainly on the high-level events and activities of the organization,
- Increase in status within the community.

The results of the contest were reviewed by a committee in a one-day session that included the OD Director, the CRC Branch Director, and other stakeholders. The committee at the end of day selected a slogan from questionnaires that the Red Cross volunteers filled out during the contest. The slogan was, "Volunteers united to reduce child mortality." The project staff decided to award a T-shirt to all volunteers that contained the new slogan to demonstrate that they were all winners. This is an example of an incentive that is meaningful yet it does not involve cash handouts.

Summary of Health Worker Performance

The implementation of the care group model is still in process. Eighty-eight percent of Red Cross volunteers reported completing eight or more home visits in the last month. Only about 40 percent of them, however, reported visiting all of their assigned households over that same period. Considering the operational time frame (six months) and timing (rice transplanting season), these data indicate that the field officers have laid the groundwork and there is a potential to achieve a high level of home visits from Red Cross volunteers in the near future.

The major area that needs attention is clarification of the role and responsibilities of the CVCG leaders. Concomitantly, the leaders need to be trained in leadership skills. An important role of the leaders should be to help train and provide followup supportive supervision to the volunteers.

The CVCG drop-out rate is very low and they have a relatively high level of job satisfaction. Their teaching skills need to be developed further to build their capacity in facilitating discussion and engaging mothers in decision-making. In addition, a strategy needs to be implemented that includes support from village leaders, VHSGs, and health center staff to help the Red Cross volunteers meet the target of visiting every household monthly.

Recommendation 16: The project should continue with its policy of not giving cash handouts as an incentive for volunteer participation. The project leadership team should discuss this issue in a staff meeting and make the policy clear to the whole staff team.

Recommendation 17: The project leadership team and the CRC Siem Reap Branch should document the volunteer contest and offer it as a best-practice model for other CRC branches.

Training

The training program for the field officers was implemented as scheduled. The field officers' training on the CS interventions was sufficient. A strength of the training program was the balance between teaching content and practice in the field. The technical training topics covered include: (1) facilitator skills, communication, and adult learning, (2) malaria transmission, prevention, and detection of danger signs, (3) insecticide treatment of bed nets, (4) diarrhea prevention, control and recognition of danger signs, (5) diarrhea treatment kit, social marketing, sales, and stock management, (6) Seven Fundamental Principles of the International Red Cross and Red Crescent Movement, (7) yellow vaccination card, and growth monitoring, (8) vitamin A and antenatal care, and (9) an introduction to behavior change communication.

The area where training needs to be strengthened is in the use of participatory methods for training Red Cross volunteers. The findings and recommendations regarding this kind of training are included in the above sections on strengthening the grantee organization (Section B.2.i) and strengthening health worker performance (Section B.2.iv).

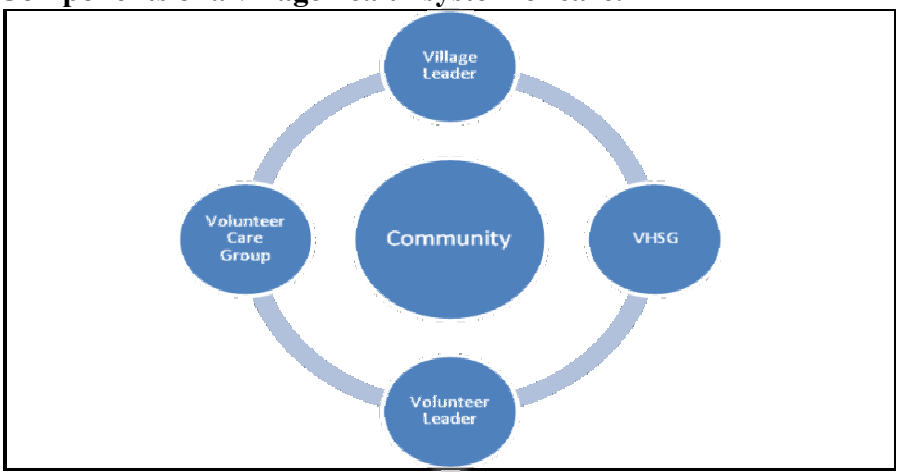
d. Sustainability Strategy

The lead evaluator recommends streamlining the sustainability strategy to focus on the following framework.

The ICH project will be sustainable if:

1. Mothers and children have good nutrition, are immunized, and they prevent and care for sick children at home;
2. A system for health care is functioning at the community level. This system is portrayed in the following diagram.

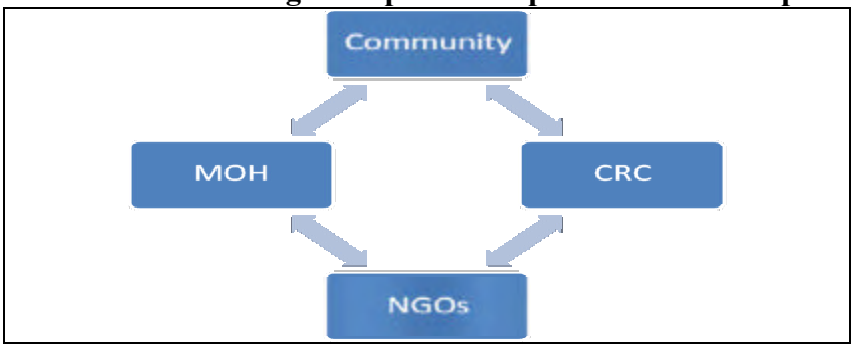
Diagram 1: Components of a village health system of care.



3. The organizational capacity is in place for all the organizations that are involved in the ICH Project:
    a. Health centers and District MOH
    b. Village leaders
    c. VHSG
    d. CVCG care group, including the group leaders
    e. ICH project team
    f. CRC Siem Reap Branch

4. A partnership is formalized, with concrete roles and agreements, between the CRC, the MOH, the community, and NGOs that work in the project area. This partnership is portrayed in the following diagram.

Diagram 2: Model for a long-term partnership for health development.



In regard to point number 2 in the framework, it will be important that all participants should regard themselves as a team, not just a collection of individuals. The findings from the MTE demonstrate that each group of organizational leaders functions well in its roles. An added step will be that they function as a team.

Recommendation #18. The project team should implement a plan for creating a village-level health team of all the people in point number 2, above. Although some members of this group meet with the health centers, the focus of that planning is health center business. The community group needs to have its own plans and clear definition of roles and responsibilities. The plans, furthermore, should be goal-driven. For example, a team in a given village could set a goal of 98 percent of children vaccinated or on schedule for complete vaccination. They would then make a plan for what each member will do, and they could monitor their progress on a graph that is publicly displayed. The graph should be placed where everyone can see it, such as the school or the outside wall of the village leader's house. The project could provide a reward (a flag, festival, etc) when a village team meets its goal.

Point number 3, above in the sustainability framework, will be addressed as the project continues with its existing plans for organizational development. (Refer to the discussions in section B.2.c, Capacity Building)

Point number 4 in the sustainability framework needs to be developed. The CRC is a national organization with a large network of volunteers that exists independent of this project. In the MTE debriefing meeting, the CRC general secretary reiterated that the CRC health strategic plan includes volunteers with a wide range of skills in prevention and health promotion. Thus it is in a position to have a long-term agreement with the provincial MOH that links its Red Cross volunteers with the work of the MOH health centers. It will be important that the community health team also be part of the agreement. If recommendation #19 is put in place, an infrastructure will exist for the community to be a full partner in the agreement.

Recommendation #19. The CRC Siem Reap Branch should take the lead to convene a sustainability planning workshop. Other branch partners, including the Danish Red Cross (which is presently funding a primary health care project in Siem Reap Province), should be encouraged to participate. The workshop should be the first step to discuss and agree on common definitions of sustainability as well as begin to develop a realistic plan for the maximum sustainability. They should use the sustainability framework that is presented above as a starting point for their discussions.

3. Family Planning

The ICH Project does not include a family planning intervention. It does, however, work closely with RACHA and the MOH in their family planning programs.

4. TB Projects

This project also does not have a TB intervention.

C. Program Management

1. Planning

The entire project team meets monthly to review data and plans for the coming month. When the lead evaluator asked project staff to see the training schedule for Red Cross volunteers, every person had a copy. It was clear that they consistently referred to and used their work plans and

training schedules. The monthly planning schedule and documentation of activities were well-organized and contained sufficient detail so as to be easily understood.

This project has excelled in communicating and planning with the MOH. The project team has been very careful to include provincial, district, and local staff in the DIP planning, the research studies, the project staff training and the monitoring and evaluation. Additionally MOH staff from all levels participated in the data analysis and action planning part of the MTE. It was clear from their participation that they have an intimate knowledge of the project and that they had a vested interest in the MTE action planning process.

2. Staff Training

Issues related to staff training were addressed previously in this report, in section B.2.b, Communication for Behavior Change, and section B.2.c.i, Strengthening the Grantee Organization.

3. Supervision of Project Staff

Staff supervision has been affected by a lack of leadership from the first project manager. (Refer to the chart in Attachment F: Special reports for a diagram of the project's organizational chart.) This person's autocratic style and low managerial capacity ignored established procedures for supervision, among other problems. This person was let go in May 2006. In July a new person was recruited and hired to fill this position.

Field officer supervision data from February to June 2006, collected as part of the ICH Project's M&E system, was reviewed. These data showed that the operation managers had not supervised all their field officers in any of these months. Furthermore, the operations managers, in turn, had not been supervised by the project manager. Although the operations managers should be expected to carry out their responsibilities, their actions were affected by the poor leadership from the former project manager.

With the new project manager in place, there is an opportunity to establish proper supervisory relationships. It is expedient to take advantage of the new project manager's capacity and experience to properly establish and monitor staff supervision. To ensure that field officers are consistently receiving adequate support, supervision/field support planning and review should be conducted weekly. All supervisors and technical support staff should set targets for their work in the field. This support should be monitored for progress on a weekly basis.

Recommendation #20. The project manager should lead a weekly meeting with the operations managers. These meetings should have a standing agenda, i.e,. a list of items that are discussed at every meeting. These agenda items should include a review of the operation managers' and field officers' reports, a discussion of problems observed and proposed solutions in the field, and detailed planning for the next weeks of field supervision. Included in the review of the project team reports should be an assessment of the project team's performance standards. For example, the monitoring and evaluation officer produces a monthly grid of the villages in the project and visits by field officers. That information should be shared transparently with all staff as a tool to ensure adequate supervision and technical support at all levels. A critical issue in this regard is ensuring the supervisory standards at all levels: the Red Cross volunteer to her assigned

households, CVCG leader support of the volunteers, field officers' visits to the volunteers, the operations managers to the field officers, and the project manager to the operations managers. Furthermore, the technical support team should be used as a resource at all levels to support capacity building as needed and appropriate.

4. Human Resources and Staff Management

This project is in the process of restructuring to include a BCC team. A British Volunteer Services Overseas volunteer has joined the project as a technical advisor. Three staff members have been hired to work on this team. The BCC team has an important role to play in light of the recommendations made in this report about health education and social marketing.

The project has a position to fill in the accounting department. At the time of the MTE this position was temporarily being filled by a person who was hired to work with the BCC team. It is essential that it be filled as soon as possible in order to free up this person for the BCC team.

Individual interviews with operations managers and field officers revealed that the work load is excessive. Operations managers are responsible for supervising seven to eight field officers. Along with other issues, management issues discussed above in Section 3: Supervision of Project Staff, supervising so many staff limits their ability to adequately supervise all field officers. Likewise, field officers expressed concern about the high workload and the difficulties in adequately supervising and supporting each CVCG for which they are responsible.

Recommendation #21. The hiring of additional staff (including field supervisor, field officers, and BCC team) should be considered if sufficient resources are available. Proper work loads will emphasis on quality versus quantity. Additionally, realistic work levels will improve staff motivation.

5. Financial Management

ARC and CRC have jointly developed financial policies and procedures for the project, which are being followed by both parties. CRC has opened a project bank account to avoid commingling of funds and promote financial transparency. Staff and vendors are paid on time.

The one issue that has arisen is the timing of the transfer of funds from the CRC headquarters to the Siem Reap branch in a timely manner. The lead evaluator, CRC Siem Reap branch director and the ARC project officer met with the CRC general secretary to bring the matter to her attention. It should be noted that the general secretary had been in that position for only a few weeks.

Following the field visit portion of the MTE the ARC Regional Director for Asia/Pacific reported that a resolution to this problem was reached. The ARC will transfer funds to the CRC one quarter in advance. This will give CRC time to implement the financial transfers to the project. Additionally he reported that financial procedures have been revised, job descriptions have been updated and an action plan is in place.

6. Logistics

This project does not include large quantities of goods and equipment, thus there are no substantial logistical problems. The one item that has been donated in quantity is the long-lasting mosquito nets. At the time of the MTE, approximately 2,000 of the nets had been distributed. As stated in the malaria control section (section B.1.b) this distribution is going according to plan.

While PSI is the implementing agency, the ICH Project is collaborating in the distribution of the Orasel kits (diarrhea treatment kits). PSI is responsible for providing all the social marketing materials and distributing the kits. A delay in the supply chain for DTK delayed the scale-up of pilot villages to an additional 20 villages until after the MTE.

7. Information Management

The project has a monitoring and evaluation officer who is skilled in MS Excel and Access. He has created an electronic toolkit for tracking activities of all the staff and summary report forms that provide a numerical account over a 30-day period. The table on the following page lists the forms in the toolkit.

Table 9. ICH M&E Toolkit.

Number	Form	Purpose
1	Field visit schedule planned and actual	Track support and monitoring to FOs in the field
2	FO monthly work plan	Organize FO schedules
3	FO daily activities	Keep track time sheet and activities
4	Monthly reporting	Report monthly activity achievement
5	Meeting database	Track all meetings attended by ICH staff
6	Field tracking on timesheets	Track time spent in the field and office
7	Volunteer database	Organize volunteer records and track retention
8	Volunteer group planning and reporting sheet/ Volunteer timesheets	Track volunteer home visits and record volunteer time as in-kind contribution to planning and achievement
9	Field trip report format form	Track support the FO activities at communities
10	Malaria Evaluation Tool	Evaluate the knowledge and behavior change of communities from baseline survey
11	Diarrhea Evaluation Tool	Evaluate the knowledge and behavior change of communities from baseline survey
12	Quarterly report format	Summarize key project information to track progress and make decisions
13	Deployment map	Field planning and FO coverage areas
14	FOs home visit monitoring	General monitoring of volunteers by FOs as they do home visits
15	Community based surveillance system (CBSS)	Case reporting of child survival target diseases by RC volunteers
16	Volunteers Drop Out Form	Track volunteer attrition

For example, the field officers have a field visit report form (No. 1). These reports are collected and summarized by the operations managers. These data are then compiled by the M&E officer to use in preparing a monthly report for the management and technical team. The link between the activity reports and the monthly summary sheet make it an excellent system. These data need to be shared back to the operations and project managers during the monthly meetings so they can be used as a management and planning tool.

The M&E officer has also created a community-based disease surveillance system (CBSS) that will be rolled out in September 2006. The M&E officer created this system in close collaboration with the OD director. The system was pilot-tested by field officers in 77 villages during August. Following feedback from the pilot test, the forms will be finalized and implemented in all 254 villages in September-October 2006. The CBSS is based on a monthly one-page form completed by the Red Cross volunteer leader with her volunteer group. They record child disease incidence (diarrhea, malaria, and ARI) for the households under their supervision. The form uses the pictures from the health education materials to indicate where the volunteers should graph the incidence of disease. The primary use of these data is by the village leader, VHSG, CVCG leader, and CVCG to increase awareness of the real health situation in their community as well as take appropriate action to address abnormal increases. The final form will be printed as a three-part carbonless form. The original will stay with the CVCG leader as a monthly record and VHSG will collect the second copy to take to the health center during the regular monthly meeting. Health centers can use this case reporting data for all villages in their catchment area and investigate any suspected outbreaks. They will also compile the data for all villages in their catchment area for their monthly report to the OD. The third copy of the CBSS from will be collected by field officers,and compiled independently to use as a quality check against the health center/OD data collection process. Once the OD data are considered high quality, ICH Project data collection will be discontinued. This will enable the health authorities to better monitor disease prevalence through case reporting. The CBSS should be written up as a best practice and shared among the CRC and other health care stakeholders.

The M&E system also has in place an outcome monitoring system. Following each technical topic, a survey tool is developed using relevant questions from the baseline survey and technical training session. Using randomized selection, households are interviewed and the results are compared with the baseline figures. As of the MTE, malaria was evaluated using this technique. The questionnaire for diarrhea has been finalized and a survey is planned for September (See Special Report annexed to this report: Diarrhea & Diarrhea Treatment Kits). This outcome monitoring system enables the project team to track progress towards achievement of the projects intermediate results.

Another information management tool is the CVCG database. The M&E officer has a file on each of the nearly 2,000 Red Cross volunteers. With the Red Cross volunteers' permission, data are collected on the volunteer's name, date of initiation as a volunteer, age, level of education, village name and district. Additionally, if a volunteer drops out, that is recorded in their file along with the reason. The database is in MS Access making it easy to produce reports with any combination of variables.

A creative tool developed by the M&E officer is an electronic deployment map with the location of all villages in the project area and a designation of the field officer who works with that village. It has proven to be very useful in planning meetings with MOH and NGO partners.

The foundation for an outcome monitoring system is the list of measurable indicators in the DIP. The list in the DIP however, is too long and is not manageable. In each of the project's interventions there were indicators for almost every aspect of the intervention. The indicator list however, should be just that, a concise list of measures that indicate overall progress.

The lead evaluator met with the ARC project officer and maternal child health advisor to review and edit the list. The revised list of measurable indicators is included in Attachment F: Special reports.

Recommendation #22: The ICH Project should adopt the revised list of measurable indicators that is included in Attachment F.

Recommendation #23. The project should establish a *short* list of outcome indicators for ongoing monitoring. Some indicators that can be considered are vaccination rates, percent of children who sleep under a treated bed net, percent of children with diarrhea who get oral rehydration solution, and percent of infants who are exclusively breastfed. It is sufficient to pick just one indicator for each intervention. One can safely assume, for example, if children are sleeping under treated bed nets, many other things are also being done for malaria prevention. The project team should also consider phasing out an indicator that shows a consistent pattern of good success. This will help to keep things simple and reduce paper work.

Recommendation #24. As a corollary to #23, there should be a system for engaging the community in tracking outcomes. The health team of community leaders (as defined in the Sustainability Framework, point #2) should be given the opportunity to identify measurable indicators and receive help from the project to monitor and report the indicators. At least in the beginning, a community should tackle one indicator at a time. One community may choose to track the use of bed nets, while another tracks vaccination rates. The community leaders should be given the choice of what they want to monitor. This is an important aspect of critical thinking and ownership on the part of community leaders. There should be a mechanism for tracking progress on a chart that everyone can see.

8. Technical and Administrative Support

The project team has used technical support throughout the project. They received support from a host of organizations in writing their DIP. From the Cambodian government these included the National Maternal and Child Health Center, National Center for Parasitology, Entomology and Malaria Control, National ARI/CDD/Cholera Control Program, Communicable Disease Control Department, National Immunization Program, the Ministry of Rural Development, Siem Reap Provincial Health Department, Angkor Chum, Pourk and Varin Administrative Districts. Participants from multilateral agencies included UNICEF Nutrition Program and WHO Child and Adolescent Health Development. USAID participants included the Office of Public Health, Family Health, and Development Assistance Specialist for MCH/RH. NGOs agencies that

participated were CARE, ADRA, Catholic Relief Services, Helen Keller International, MEDiCAM, PLAN, PSI, RACHA, University Research Corporation, Volunteer Service Organization, Belgian Technical Assistance, Buddhists for Development and World Relief.

As detailed previously, the project also received support from numerous organizations for both the operations research studies. (Refer to Attachment F: Special Reports.)

The national headquarters of the American Red Cross has also provided technical support through field visits and backstopping and through ongoing telephone and email communication. Technical assistance was especially valuable in assisting CRC with administrative and financial systems. ARC contributed assistance from the Southeast Asia program officer, the Southeast Asia area representative, the Asia/Pacific regional director and the senior international financial analyst. (Refer to Section C.5, for a discussion on assistance with financial systems.)

In program development, the ARC maternal and child health advisor conducted a site visit within six months of the project becoming operational. She provided advice in the areas of behavior change strategy, use of the Child Survival Sustainability Framework and its accompanying tool, monitoring and evaluation, procedures for growth monitoring sessions in the community, treated bed net distribution planning, and preparations for the MTE.

The technical support of the British VSO Volunteer for the BCC team is timely as this is a component that will require a lot of work. Additionally, the VSO is an experienced community nurse and midwife and will serve as the project's breastfeeding expert once that intervention is implemented.

9. Mission Collaboration

USAID/Phnom Penh has actively collaborated on the project. Both the family health team leader and the development assistance specialist for MCH/RH participated in the detailed implementation planning workshops.

The acting director of the office of public health and the development assistance specialist for MCH/RH both participated in the *10,000 long-lasting insecticide treated mosquito nets and volunteer contest results ceremony.* The acting mission director and the development assistance specialist for MCH/RH also participated in a one-day project briefing and field visit.

The development assistance specialist for MCH/RH is the official child survival focal person at USAID/Phnom Penh. She was highly involved in the MTE. An initial consultation about the MTE design was held during the Regional Child Survival Conference in Vientiane, Laos. A follow-up MTE planning meeting was held with the development assistance specialist for MCH/RH in Phnom Penh with the ARC technical backstop officer, the ARC project officer, and the ARC Southeast Asia regional representative.

USAID/Phnom Penh has been a valuable resource for identifying technical assistance. Both the acting director of the office of public health and the development assistance specialist for MCH/RH have regular email communication with the ARC project officer. They have supported dissemination of the operations research reports as well as facilitated contact with the National

Center for Health Promotion's Behavior Change Communication Project. The development assistance specialist for MCH/RCH has provided sound advice on the rollout of interventions and technical training. This support and assistance has been timely and appropriate

D. Other Issues Identified by the Team

No other issues were identified by the evaluation team.

E. Conclusions and Recommendations

Conclusions

The ICH project has made excellent progress in children's vaccination coverage. The intermediate indicators from the MTE give evidence that the goal of 80 percent of eligible children being fully immunized should be reached and surpassed.

1. Good progress has been made in malaria and diarrhea control. A high proportion of mothers know at least two signs of these illnesses.

2. Oral rehydration for treating diarrhea (either from ORS packets of the diarrhea treatment kit) was identified by less than 50 percent of the mothers as something they would do if their child had diarrhea. (It should noted, however, that this is an increase from 33 percent found during the baseline survey.) Given that this message has only been addressed six months prior to the MTE, it is not an alarming finding. This problem can be effectively addressed through participatory learning methods.

3. The introduction of long-lasting insecticide-treated mosquito nets is an important innovation. Given that bed nets are already widely used, these nets should be readily accepted by the population.

4. Community mobilization is a strength of this project. Data from the village leaders and health centers show a high level of activity. Additionally village leaders report a high level of involvement with other NGOs.

5. The care group model has been functioning for less than nine months and the component that needs to be developed is the role of the CVCG leader. The role of the CVCG leader is not clearly understood and they do not lead the care group meetings. Additionally, a strategy is needed that includes support from community leaders to help the Red Cross volunteers meet the target of visiting every household monthly.

6. This project has done an excellent job in communicating and planning with all levels of the MOH. The project team has been very careful to include provincial, district, and local staff in all stages of the project.

7. The system for staff supervision needs to be strengthened. Activity reports need to be consistently reviewed by all supervisors and procedures need to be put in place for feedback to staff.

Recommendations

1. The project is implementing the fixed-site vaccination strategy. It is a departure from the strategy previously held by the MOH National Immunization Program (NIP). Following a successful pilot supported by WHO, the NIP approved a carefully monitored scale-up of the approach. The project team should expand its pilot and implement it in all health centers that qualify.

2. The project team should be sure that the key messages about diarrhea treatment and prevention are well-understood before proceeding to new interventions. The fact that the messages are widely diffused is not enough. There should be a goal that 80 percent or more of mothers identify oral rehydration solutions as an intervention for home treatment.

3. The Orasel diarrhea treatment kit should be expanded from its pilot phase to full implementation in the malaria-endemic areas. Furthermore this expansion process should be documented and shared with the MOH and the NGO community. It presents an alternative to the tradition of purchasing antibiotics for diarrhea treatment, and it contains a more complete rehydration solution than the current rehydration packet.

4. The ICH project leaders should document and publish their model for distributing the long-lasting bed nets. They should scale-up this intervention and cover all the malaria-endemic areas. These nets overcome the need to retreat bed nets every few months and can make a signification contribution to reducing the incidence of malaria, especially in children.

5. The plan is to initiate exclusive breastfeeding soon after the MTE is completed. Before doing so the project team should first develop and implement participatory leaning methods as described in the following Section B.2.b. Behavior change and communications. It will take time to train the field officers in participatory learning skills, and they, in turn, will need time to train the Red Cross volunteers and the CVCG leaders. Thus the project leaders should revise their implementation schedule accordingly.

6. An alternative growth monitoring strategy (not linked to health center outreach) needs to be developed for villages that are no longer targeted for outreach due to the expansion of the fixed-site strategy.

7. The project team should take advantage of this level of leader involvement by including the village leaders in their behavior change and communication strategy. This does not necessarily mean that they should receive the same training as the Red Cross volunteers. Rather village leaders can be enlisted to participate in community events, informational meetings, and kick-off events. The project's communication strategy should include them as human resources, or

communication channels, for the diffusion of the health messages. (Refer to the framework for a communication strategy)

8. The project team should develop participatory methods in facilitating adult learning training. Acquiring facilitation skills could be a challenge for the field officers who have a teaching background, so it will be important to not underestimate the importance this training.

9. The project team should adopt a BCC strategy that integrates social marketing and behavior change, as illustrated in Table 6. There are a numerous evidence-based communication and behavior change models; the one in Table 6 is one possibility. The project team should adopt one, however, and use it to structure their BCC strategy.

10. The project team must adhere to the work plan in the DIP and resist introducing additional interventions and activities. Because of the delay in signing the contract, it is urgent that the project focus on completing the plan that is in its contract with USAID.

11. The leadership role of the CVCG leaders needs to be explicitly defined and understood by all project and health center staff and, in turn, by the Red Cross volunteers and the CVCG leaders. The project should include some additional leadership skills training for the leaders, including skills and practice with supportive coaching, motivational interviewing, and group facilitation.

12. The CVCG leaders should be jointly responsible for training in the CVCG. Currently they are just participants in the training done by the field officers. In the Cambodian culture, a teacher has high social status and being regarded as a teacher by the CVCG group will greatly strengthen their leadership status. This training should include skills coaching and mentoring of the CVCG leaders as adult educators.

13. The project team should repeat the training on roles and responsibilities and the Red Cross seven fundamental principles, but use participatory methods and IEC materials. The CRC Siem Reap Branch should participate in the training and in the development of IEC materials. The branch office, in turn, could make this a model that can be used by other CRC branch offices throughout the country. These topics are crucial for the sustainability of the project.

14. The project leaders should carefully analyze the time commitments that are requested of the Red Cross volunteers to make sure that they are not being asked to commit more than the agreed upon twelve hours. They should consider for example, changing the monthly number of household visits from two to one per month.

15. The project team, CVCG leaders, and the VHSG should join in setting a goal and target date for when all households receive monthly visits. They then should work together to help the Red Cross volunteers reach the goals. An incentive program could be included where the *whole community* is recognized for training and support of all targeted households. It is important that the efforts to increase the household visit rate be done in a positive way to ensure community support. An important component is the supports of village leaders in this process.

16. The project should continue with its policy of not giving cash handouts as an incentive for volunteer participation. The project leadership team should discuss this issue in a staff meeting and make the policy clear to the whole staff team.

17. The project leadership team and the CRC Siem Reap Branch should document the volunteer contest and offer it as a best-practice model for other CRC branches.

18. The project team should implement a plan for creating a village-level health team of all the people in point number 2 of the sustainability strategy. Although some members of this group meet with the health centers, the focus of that planning is health center business. The community group needs to have its own plans, goals, and clear definition of roles and responsibilities. The plans, furthermore, should be goal-driven. For example, this group in a given village could set a goal of 98 percent of children vaccinated or on schedule. They would then make a plan for what each member will do, and they could monitor their progress on a graph that is publicly displayed. The graph should be placed where everyone can see it, such as the school or the outside wall of the village leader's house. The project could provide a reward (a flag, festival, etc) when a village team meets its goal.

19. The CRC Siem Reap Branch should take the lead to convene a sustainability planning workshop. Other branch partners, including the Danish Red Cross (which is presently funding a primary health care project in Siem Reap Province), should be encouraged to participate. The workshop should be the first step to discuss and agree on common definitions of sustainability as well as begin to develop a realistic plan to ensure maximum sustainability. They should use the sustainability framework that is presented above as a starting point for their discussions.

20. The project manager should lead a weekly meeting with the operations mangers. These meetings should have a standing agenda, i.e., a list of items that are discussed at every meeting. These agenda items should include a review of the operation managers' and field officers' reports, a discussion of problems observed and proposed solutions in the field, and detailed planning for the next weeks of field supervision. Included in the review of the project team reports should be an assessment of the project team's performance standards.

21. The hiring of additional staff (including field supervisor, field officers, and BCC team) should be considered if sufficient resources are available. Proper work loads will emphasis quality versus quantity. Additionally, realistic work levels will improve staff motivation.

22. The ICH Project should adopt the revised list of measurable indicators that is included in Attachment F.

23. The project should establish a *short* list of outcome indicators for ongoing monitoring. Some indicators that can be considered are vaccination rates, percentage of children who sleep under a treated bed net, percentage of children with diarrhea who get the oral rehydration solution, and percentage of infants who are exclusively breastfed. It is sufficient to pick just one indicator for each intervention. One can safely assume, for example, if children are sleeping under treated bed nets, many other things are also being done for malaria prevention. The

project team should also consider phasing out an indicator that shows a consistent pattern of good success. This will help to keep things simple and reduce paper work.

24. As a corollary to #21 there should be a system for engaging the community in tracking outcomes. The health team of community leaders (as defined in the Sustainability Framework, point #2) should be given the opportunity to identify measurable indicators and receive help from the project staff to monitor and report the indicators. At least in the beginning, a community should tackle one indicator at a time. One community may choose to track the use of bed nets, while another tracks vaccination rates. The community leaders should be given the choice of what they want to monitor. This is an important aspect of critical thinking and ownership on the part of community leaders. There should be a mechanism for tracking progress on a chart that everyone can see.

F. Results Highlight - One Page "Results Highlight"

An innovation introduced by this project is the use of long-lasting insecticide treated mosquito nets to prevent malaria transmission. The importance of this innovation is underscored by findings from the mid-term evaluation.

The MTE team interviewed mothers, Red Cross volunteers, and village leaders about malaria control. Mothers were asked about the use of bed nets and the signs of malaria. Table 4, below, presents the findings regarding the use of bed nets.

Table 4: Family use of bed nets. N=288

Variable	Response Rate
Families with children under five, with bed nets	83 percent
Bed nets treated with insecticide	18 percent*
Children under five who slept under an insecticide treated bed net	25 percent

**Note: this datum represents all households interviewed, including some that did not have children under five.*

It is encouraging that 83 percent of families reported having bed nets. The fact that only 25 percent of children slept under one presents the challenge to ensure that the nets are treated with insecticide and that children sleep under one. One problem is that the treatment lasts for approximately only three months. Consequently, children wind up sleeping under ineffective nets.

An intervention that began just before the MTE is the introduction of long-lasting bed nets. The ICH project received a donation of 10,000 LLINs from the International Federation of Red Cross and Red Crescent Societies. It is the first project to use long-lasting technology in Cambodia. These nets are expected to have a repellent life of four to five years. With the MOH Operational District, the project has devised a four point distribution scheme.

- First, free nets will be provided to pregnant women completing two ante-natal care (ANC) visits or women giving birth at the health center.
- Second, free nets will be given to very poor families with children under two years of age.
- Third, for those families that can afford to purchase bed-nets, they will be sold at reduced prices in the village.
- Fourth, one free mosquito net will be given to all active village leaders, village health support group members, and Cambodian Red Cross volunteers.

Given the high percent of families that use bed nets, there should not be barriers to the acceptance of these nets. The project staff is well aware of the urgency to distribute these nets and have plans to continue their distribution as soon as the MTE is completed.

II. The Action Plan

A. Response to recommendations

Recommendation 1.
An innovation that is being supported by the project is the fixed-site vaccination strategy. It is a departure from the strategy previously held by the MOH National Immunization Program (NIP). Following a successful pilot supported by WHO, the NIP approved a carefully monitored scale-up of the approach. The project team should expand its support to all health centers that qualify.

Response 1.
The Operational District is moving forward with expansion of the fixed-site strategy to all health centers. That means health center outreach will not continue for villages situated within two to five kilometers distance from the health center (specific village inclusion/exclusion determined by each health center). The ICH Project will not expand financial support for transportation to bi-monthly HC meetings. However, the project will support through follow-up with mothers of children needing vaccinations and mobilizing them to go to the HC for vaccination services. Additionally, RCVLs will be encouraged to attend monthly HC meetings and will be provided with a bicycle to facilitate transportation.

Initially, four additional HCs will be targeted for more intensive support. A meeting will be scheduled at each of these HCs to develop a local plan to support the fixed-site strategy. This plan will include the establishment of a village level committee consisting of the village leader, VHSG and RCVL. HC staff and FOs will provide support to each committee. Each village committee will set indicators and targets; this will serve to motivate achievement of agreed upon targets (e.g. number of vaccinations provided at health center, percentage of total coverage, etc.). An evaluation committee will be established to review the results and provide non-cash incentives on a regular basis (flags, plaques, certificates, etc.) to volunteers achieving their targets.

Lessons learned from this approach will be applied to remaining health centers.

Recommendation 2.
The project team should be sure that the key messages about diarrhea treatment and prevention are well understood by mothers before proceeding to new interventions. The fact that the messages are widely diffused is not enough. There should be goal that 80% or more of mothers identify oral re-hydration solutions as an intervention for home treatment.

Response 2.
As of the time of writing this report, a three-part strategy was developed and initiated to ensure mothers' understanding and improved practices of diarrhea prevention and control. First, diarrhea prevention and control refresher trainings with RCVs are underway and they will have a clear plan to visit each household with follow-up from the RCVL (see Response 14). These trainings use more interactive approaches including discussion and demonstration. Specifically, ORT preparation and handwashing demonstrations are being used (see Response 8 related to

participatory methods). Additionally, each RC volunteer is provided with one 'promotional' packet of *orasel* (DTK villages) or oralit (non-DTK villages) as well as a one-liter bottle to use for ORS preparation. This incentive has the dual purpose of transforming RC volunteers into ORT advocates as well as activating them to complete their home visits while renewing their focus on diarrhea prevention and control.[1]

Second, the BCC team has initiated community-based edutainment sessions focusing on diarrhea prevention and control. These dynamic and interactive sessions, which include handwashing of all participants, are extremely well received in the villages. Village leaders and RC volunteers have been very successful at mobilizing participation. As of the writing of this report more than 1,500 villagers in 20 villages have participated in these two-hour sessions.

Third, each volunteer group will set targets for mothers' knowledge and behavior. When a RCVG believes that all mothers have a good understanding of the topic, an evaluation will be conducted in their village with participation from the village leader (see Response 7) to assess changes on key points related to diarrhea prevention and control. Certificates will be provided to each volunteer group or village that is able to demonstrate that they have achieved their target.

Recommendation 3.
The *Orasel* diarrhea treatment kit should be expanded from its pilot phase to full implementation in all 254 villages supported by the project. Furthermore, this expansion process should be documented and shared with the MOH and the NGO community. It presents an alternative to the tradition of purchasing antibiotics for diarrhea treatment, and it contains a more effect re-hydration solution than the current re-hydration packet.

Response 3.
At the time of writing of this report, the ICH Project has expanded *Orasel* to a total of 40 villages, and an additional 20 villages in Varin District in November (following confirmation of the continuation of the PSI pilot).

The project has laid the groundwork for expansion of the DTK pilot to all 254 villages. This has been done by including DTK as a recommended care option for simple diarrhea in the IEC materials. This information has been included as part of the village-based volunteer trainings to all CRC volunteers. Field officers have repeatedly requested scale-up of this intervention to all villages. Additionally, budget resources have been set aside for DTK procurement to scale.

However, expansion will depend on product availability. At the time of writing of this report, PSI stated that the DTK pilot has been extended through December 2006. PSI will conduct a formal evaluation of the pilot; this will be used by USAID/Phnom Penh to determine next steps.

The DTK experience will be included in a best practices and lessons learned document.

[1] Once RC volunteers are achieving their expected number of home visits, most future incentives will be awarded following confirmation of mothers' knowledge and behavior

Recommendation 4.
The ICH Project leaders should document and publish their model for distribution the long-lasting bed nets. They should scale-up this intervention and cover all the malaria-endemic areas. These nets overcome the need to re-treat bed nets every few months and can make a signification contribution to reducing the incidence of malaria, especially in children.

Response 4.
A best practices and lessons learned document will be published; it will include the segmented and targeted long-lasting bed net distribution strategy and results. Related to scale-up, at the time of writing of this report, all RC volunteers had received a LLIN as an incentive. Additionally, the ICH Project team coordinated a one-day workshop with the OD and all HC directors to complete detailed planning of distribution of LLINs to HC target groups (during ante-natal clinics and delivery at HC). Additionally, LLINs and supporting IEC materials have been distributed to all HCs. Free distribution to the poorest of the poor with children under 2 years of age as well as subsidized selling of LLINs throughout the project area will be done in 2007 as per the revised workplan.

Recommendation 5.
The plan is to initiate exclusive breastfeeding soon after the MTE is completed. Before doing so the project team should first develop and implement participatory leaning methods as described in the Behavior change and communications section. It will take time to train the field officers in participatory learning skills, and they in turn will need time to train the RCVs and the RCVLs. Thus, the project leaders should revise their implementation schedule accordingly.

Response 5.
The breastfeeding intervention has been postponed until 2007 (see attached revised workplan). Response 8 below details actions related to participatory learning.

Additionally, the operations research proposed in the DIP related to provision of other fluids before the onset of breastfeeding is no longer necessary. The Ministry of Health's National Nutrition Program with technical direction from the Infant and Young Child Feeding Working Group undertook a comprehensive qualitative study entitled "INFANT AND YOUNG CHILD FEEDING PRACTICES IN SELECTED PROVINCES OF THE KINGDOM OF CAMBODIA: A REPORT". This study was published in April, 2006. The results and recommendations from this study will direct the communications strategy for the breastfeeding intervention.

Recommendation 6.
An alternative growth monitoring strategy (not linked to health center outreach) needs to be developed for villages that are no longer targeted for outreach due to the expansion of the fixed-site strategy.

Response 6.
Preliminary discussions among the project team resulted in the tentative plan to assign growth monitoring responsibility to the VHSG and RCVL so that this activity can happen in the village on a monthly basis. However, a group consultation with the OD and HC staff was not possible

before the writing of this report. Therefore, the issue will be added to the collaboration workshop TOT agenda (see Response 17), so that the final strategy can be decided upon with full participation from OD and HC stakeholders.

Recommendation 7.
The project team should take advantage of this level of village leader involvement by including them in their behavior change and communication strategy. This does not necessarily mean that they should receive the same training as the RCVGs. Rather village leaders can be enlisted to participate in community events, informational meetings and kick-off events. The project's communication strategy should include them as human resources, or communication channels, for the diffusion of the health messages.

Response 7.
Increased participation of village leaders will focus on the following areas:

1. Coordination workshops will be organized with participation from key stakeholders in each village to strengthen overall collaboration among HC staff, village leaders, VHSG, and RCVGs. As of the writing of this report, a one-day workshop curriculum and corresponding training of trainers (TOT) curriculum has been developed; these workshops will focus on reviewing roles and responsibilities of each key stakeholder (also see Response 17); additional points that will also be discussed as part of this workshop are detailed below.
2. Village leaders will be engaged to participate in village-based monthly training and reporting meetings to review the CBSS as well as complete follow-up action planning with the VHSG, RCVLs, and RCVs;
3. Village leaders will be engaged in village level evaluations of mothers' knowledge and practices in order to hold volunteers and community members accountable;
4. Village leaders will be encouraged to renew their participation in monthly HC meetings;
5. Village leaders will be asked to provide testimonials, endorsing key health practices, during village meetings;
6. Targeted village leader meetings will be programmed in coordination with the OD and HCs as needed to follow-up events, campaigns, and outbreaks detected by the CBSS.

Recommendation 8.
The project team should develop participatory methods as well as train staff on facilitating adult learning. Acquiring facilitation skills could be a challenge for the field officers who have a teaching background, so it will be important to not underestimate the importance of this training.

Response 8.
The FOs have requested skills training to work more effectively with their respective RCVGs. The strategy to increase participatory methods focuses on two approaches: skill development workshops and field support (including supervision and technical support).

As of the writing of this report, a participatory learning training program has been developed and is being rolled-out. Three one-day workshops focusing on interactive use of IEC materials,

discussions, demonstrations, and role-plays have been completed. As additional interactive skill gaps are identified (e.g. session planning, negotiation of improved practices, etc.), training will be provided to continue to build skills among all project staff.

Related to field support, a management and technical field support intensification strategy has been developed to ensure adequate follow-up and support to build FO capacity related to participatory approaches. This strategy uses a weekly meeting (see Response 19) to review field supervision from the previous week as well as complete detailed planning for the following week's support. These meetings will also be used to identify technical support needs among FOs and assign technical staff to follow-up on needed support.

As of the writing of this report, the ICH Project team discussed and agreed upon a tracking system to ensure adequate field support by monitoring planned versus actual support. The system uses a large whiteboard to record and display this information in the main training area of the project office.

Recommendation 9.
The project team should adopt a BCC strategy that integrates social marketing and behavior change, as illustrated in Table 6. There are a numerous evidence-based communication and behavior change models; the one in Table 6 is one possibility. The project team should adopt one however, and use it to structure their BCC strategy.

Response 9.
Following review of this recommendation, the management and technical team temporarily accepts the suggested BCC framework/model, with the recognition that this needs further discussion in order for the selected approach to be appropriately understood and assimilated by all project staff. Review of this BCC framework, as well as an all-staff exchange visit to the World Relief Child Survival Project in Kampung Cham in September, generated several specific ideas to diversify, and therefore strengthen the ICH Project's communication strategy. Specific media approaches are detailed using the BCC framework below.

1. Awareness Building Stage
    a. Audio health messages will be collected and copied onto CDs. These CDs will be distributed to pagodas and community people with loudspeaker systems. They will be asked to sign a contract to play at least one health announcement every day. The BCC team will also broadcast the same messages using a portable CD/audio system.
    b. Health message chants will be developed by engaging Buddhist monks in a contest to create chants or mantras related to their choice of C-IMCI key family practices. Monks will be invited to share these mantras at community events, during HC outreach, and at blessing ceremonies at each health center.
    c. Leaflets, stickers, and murals will be piloted to reinforce key family practices where feasible.[2]

[2] Copying 38,000 leaflets (one for each household) will generate a lot of paper and add an unbudgeted, recurring cost. Furthermore, considering low literacy rates among the target population, these leaflets will have to depend

d. Puppet shows, dramas, and edutainment sessions will be developed and promoted as community-based events by the BCC team.

2. Preparation Stage
    a. Role plays will be developed for each topic
    b. Demonstrations such as preparation of ORS, handwashing, and vitamin A rich foods will be used as a tool to help caretakers.
    c. Small group discussions focusing on open ended questions and answers will create a safe environment for volunteers, and then mothers, to identify the barriers and benefits of each health behavior;
    d. A health message card game will be developed and used by RC volunteers as a tool to repeatedly discuss key health topics. The game will use pictures from the IEC materials.

3. Action Stage
    a. Negotiation and trials of improved practices will encourage mothers to make a conscious decision to try new practices;
    b. Follow-up with each mother is essential to reinforce the successful trial or resolve issues which prevented the improved practice.

4. Maintenance Stage
    a. Testimonials of village leaders and role models (see Response 7) who have experienced the benefits of changed behavior will reassure villages unsure about the public perception of the new practice;
    b. Rewards for behavior changes at the village level will include certifying villages as ORS or baby friendly (see Response 2);
    c. Recognition of individuals for improved practices by providing a plastic cover for the yellow immunization cards, stickers identifying households that have adopted a specific practice, and public recognition by village leaders during village meetings.

Lessons learned from these initiatives will be documented in the best practices and lessons learned document.

Recommendation 10.
The leadership role of the CVCG leaders needs to be explicitly defined and understood by all project and HC staff, and in turn by the RCVGs. The project should include some additional leadership skills training for the leaders and provide skills and practice with supportive coaching, motivational interviewing, and group facilitation.

Response 10.
The coordination workshop training of trainers (TOT) will be used to define and clarify the role of RCVLs among all FOs and HC staff. As coordination workshops are rolled out in each health

almost exclusively on simple pictures. The effectiveness of this approach will be piloted in a small number of villages in order to test the value added and effectiveness of this approach before it is scaled-up.

center, the role of the RCVLs will be further discussed and understood by all village level stakeholders including RCVs (see Response 17).

Additionally, practical training workshops will be organized to clarify roles and responsibilities as well as strengthen leadership skills among RCVLs and selected VHSGs.

Recommendation 11.
The RCVLs should be jointly responsible for training in the RCVG. Currently they are just participants in the training done by the FOs. In the Cambodian culture a teacher has high social status and being regarded by the RCVG as a teacher will greatly strengthen their leadership status. This training should include skills coaching and mentoring of the RCVGs as adult educators.

Response 11.
The RCVL role as trainer will be clarified during the TOT coordination workshop and further emphasized during the leadership training sessions (see Response 10). Following the RCVLs capacity level, FOs have begun a coaching approach to empower RCVLs with training responsibility. FOs will develop a graduated plan to reduce their training time as the RCVL assumes greater responsibility.

Recommendation 12.
The project team should repeat the training on roles and responsibilities and the Red Cross Fundamental Principles, but use participatory methods and IEC materials. The CRC Siem Reap Branch should participate in the training and in the development of IEC materials. The Branch office in turn, could make this a model that can be used other CRC branch offices throughout the country. These topics are crucial for the sustainability of the project.

Response 12.
The fact that few RCVs were able to recall that they had been trained on this topic irrelevant. Notwithstanding RCVLs, RCVs consistently demonstrate a good understanding of their role and responsibilities. The volunteer motivation contest engaged each volunteer group to define their role and responsibilities, this provided evidence of a good understanding among RCVG's. Furthermore, individual interviews with RCVs corroborates that they understand and accept their role to promote improved health practices with their assigned households. It is acknowledged that more work needs to be done to motivate volunteers to complete home visits (see Responses X & 14).

Related to repeat training on the Fundamental Principles and Code of Conduct using participatory methods and IEC materials, it is important to recognize that this training topic is somewhat abstract. The project will develop supporting IEC materials and a participatory training curriculum in order to revisit this topic.

Recommendation 13.
The project leaders should carefully analyze the time commitments that are requested of the RCVGs to make sure that they are not being asked to commitment more than the agreed upon

twelve hours. They should consider for example, changing the monthly number of household visits from two to one per month.

Response 13.
Following careful consideration among all project staff, it was decided to continue with the target of two visits per RCV per month. Project staff did not feel that one visit per month would be sufficient to achieve behavior change among mothers. Furthermore, staff believe that two visits per month is realistic and the planned activation of RCVLs whom will be made responsible for follow-up and support to their volunteers, should facilitate the achievement of this target.

Recommendation 14.
The project team, RCVGs, and the VHSG should join in setting a goal and target date for when all households receive monthly visits. They then should work together to help the RCVGs reach the goals. An incentive program could be included where the *whole community* is recognized for training and support of all targeted households. It is important that the efforts to increase the household visit rate be done in a positive way to ensure community support. An important component is the supports of village leaders in this process.

Response 14.
RCVGs track monthly household visits using the *home visit monitoring form* (M&E tool #14). FOs are responsible for assisting RCVLs to set up a clear plan using this tool. Progress is reviewed during the monthly village-based information meeting, with the requested participation from the village leader and VHSG. RCVLs will be activated to provide follow-up and support to their volunteers throughout the month to improve completion rates. At the project level, this information is also compiled at the project level and is now prominently displayed in the main training area of the project office.

Performance-based incentives (such as volunteer notebooks, calendars, etc.) will be provided to RCVGs, VHSG, and village leaders following verification of mothers' knowledge and behavior change following each training topic, as opposed to completion of visits.

Recommendation 15.
The project should continue with its policy of not giving cash handouts as an incentive for volunteer participation. The project leadership team should discuss this issue in a staff meeting and make the policy clear to the whole staff team.

Response 15.
This issue was thoroughly discussed at a management team and FO monthly meetings immediately following the MTE. Field officers whom were providing a cash incentive stated that they did not understand the implications of this approach. All management staff publicly denounced this practice and all FOs agreed to immediately discontinue cash transfers.

Nearly two months following this discussion, there have been no reports that this practice is being continued. The project and operations managers are responsible for follow-up and

monitoring this activity. The management team is committed to taking any necessary action to end cash transfers including discontinuation of the snack allowance.

Recommendation 16.
The project leadership team and the CRC Siem Reap Branch should document the volunteer contest and offer it as a best-practice model for other CRC branches.

Response 16.
The volunteer motivation contest will be documented in the best practices and lesson learned document and will be shared among all project stakeholders.

Recommendation 17.
The project team should implement a plan for creating a village level health team of all the people in point number 2 of the sustainability strategy. While some members of this group meet with the health centers, the focus of that planning is health center business. The community group needs to have its own plans, goals and clear definition of roles and responsibilities. The plans, further more should be goal driven. For example this group in a given village could set a goal of 98% of children vaccinated or on schedule. They would then make a plan for what each member will do, and they could monitor their progress on a graph that is publicly displayed. The graph should be placed where everyone can see it, such as the school or the outside wall of the village leader's house. The project could provide a reward (a flag, festival, etc) when a village team meets its goal.

Response 17.
Coordination workshops will be organized with participation from key stakeholders in each village to strengthen overall collaboration and sense of teamwork among a village level health team including HC staff, village leaders, VHSG, and RCVGs. The agenda for these one-day workshops among the village level health team will be to discuss roles and responsibilities, as well as goal setting, and activity planning.

As of the writing of this report, a one-day workshop curriculum and corresponding training of trainers (TOT) curriculum has been developed; these workshops will focus on review roles and responsibilities of each key stakeholder.

Villages achieving their defined goals will be rewarded incentives such as health cards decks (see Response 9), volunteer posters, and plastic covers for yellow vaccination cards (see Response 14).

Recommendation 18.
The CRC Siem Reap Branch should take the lead to convene a sustainability planning workshop. Other branch partners, including the Danish Red Cross (presently funding a primary health care project in Siem Reap Province), should be encouraged to participate. The workshop should be the first step to discuss and agree on common definitions of sustainability as well as begin to develop a realistic plan to maximize the potential for sustainability.

Response 18.
During its Annual Partners Meeting in October, the Cambodian Red Cross committed to organizing a sustainability workshop as a necessary follow-up action. It is anticipated that this workshop will help to define a common understanding of sustainability and will serve a framework under which the CRC Siem Reap Branch can develop a realistic action plan with support from the both the Danish Red Cross and American Red Cross.

The CRC Siem Reap Branch has identified two areas needing further discussion as part of the proposed branch-level workshop: (1) RC volunteer capacity at the community level, and (2) the minimum level of branch support following the end of the project. Related to volunteer capacity at the community level, the branch has recognized that it is imperative the project leave in place a volunteer structure which can realistically continue its work with minimal support from the branch. It is recognized that this will require that each volunteer group to develop the capacity and habit to continue its work as part of a community health team (see Response 17). The concern from the CRC Siem Reap Branch is that two more years of the project may not be enough time to ensure sufficient capacity and custom among volunteers at the community level. This raises the issue of possible diversification of donors or continuation of funding to permit ample time to establish a permanent community-based structure.

Related to the level of support following the post-project phase, a minimal level of supervision and volunteer incentives as well as the corresponding financial resources required for the post-project phase needs to be defined, additionally, a new revenue generation activity that will provide adequate financial resources to fund the post-project phase needs to be explored.

In order to support the branch sustainability plan, the branch is in the process of hiring one administrative assistant (see Response 20).

Recommendation 19.
The project manager should lead a weekly meeting with the operations managers. These meetings should have a standing agenda, i.e. a list of items that are discussed at every meeting. These agenda items should include a review of the operation managers' and field officers' reports, a discussion of problems observed and proposed solutions in the field, and detailed planning for the next weeks of field supervision. Included in the review of the project team reports should be an assessment of the project team's performance standards.

Response 19.
The project manager, project coordinator, and three field supervisors attended a six-day *Community Health Promotion Management* training in October, 2006 to establish a common understanding of community health promotion principles including: importance of management, manager's roles, types of management, and stakeholder motivation.

Related to field support, a management and technical field support intensification strategy has been developed to ensure adequate field support. This strategy uses a bi-weekly meeting to review field supervision from the previous week as well as complete detailed planning for the

following period's support. These meetings will also be used to identify technical support needs among FOs and assign technical staff to follow-up on needed support.

Additionally, each operations manager has a weekly meeting with the FOs whom they supervise to review achievement and plan for the upcoming week's activities as well as discuss and solve issues as they arise.

As of the writing of this report, the ICH Project team discussed and agreed upon a tracking system to ensure adequate field support by monitoring planned versus actual support. The system uses a large whiteboard to record and display this information in the main training area of the project office.

Recommendation 20.
The hiring of additional staff (including field supervisor, field officers, and BCC team) should be considered if sufficient resources are available. Proper workloads will emphasis quality versus quantity. Additionally, realistic work levels will improve staff motivation.

Response 20.
As of the writing of this report, the vacant positions of one field officer and one accountant have been filled. Furthermore, the budget resources have been identified and administrative action has been completed to create six (6) new positions: one (1) administrative assistant one (1) operations manager, two (2) field officers, and two (2) BCC officers. CRC is presently recruiting for these positions and expects to have them filled by November, 2006. The project team is using the field officer deployment map (M&E tool #13) to strategically redistribute communities among operations managers and field officers.

Recommendation 21.
The ICH Project should adopt the revised list of measurable indicators that is included in Attachment F.

Response 21.
The revised list of measurable indicators has been adopted.

Recommendation 22.
The project should establish a *short* list of outcome indicators for ongoing monitoring. Some indicators that can be considered are vaccination rates, percent of child who sleep under a treated bed net, percent of children with diarrhea who get oral rehydration solution, and percent of infants who are exclusively breastfed. It is sufficient to pick just one indicator for each intervention. One can safely assume, for example, if children are sleeping under treated bed nets, many other things are also being done for malaria prevention. The project team should also consider phasing out an indicator that shows a consistent pattern of good success. This will help to keep things simple and reduce paper work.

Response 22.
The short outcomes list will focus on the "Cambodian Scorecard Indicators" for child survival. These indicators had been agreed upon to monitor progress on key priority interventions during the December, 2004 National Child Survival Partnership Workshop in Phnom Penh. Furthermore, these indicators were integrated into the original ICH Indicator Performance Tracking Table. They are as follows:

Core Intervention	Scorecard Indicator	ICH Project SO
1. ORT for diarrhea	% of children with diarrhea in the last 2 weeks who received ORT*	Community Management of the Sick Child
2. Six month exclusive BF; timely introduction of complementary foods	% of infants <6 months exclusively breastfed; % of breastfed infants 6-9 months receiving semi-solid foods	Nutrition and Breastfeeding
3. Antibiotics to treat pneumonia	% of children with fast or difficult breathing in the last 2 weeks who received medical care*	Community Management of the Sick Child
4. Improve neonatal health	% of women who received at least two tetanus toxoid doses during pregnancy	Immunization
5. Vitamin A supplementation	% of children 6 to 59 months receiving one dose of Vit A in the past 6 months	Immunization
6. Increase routine immunizations	% of infants receiving dose of measles vaccine; % of children <1 receiving all immunizations*	Immunization
7. Promote access to ITN	% of children who slept under an ITN last night	Community Management of the Sick Child
8. Promote access to anti-malarials	% of children living in malarious areas with fever in the past 2 weeks who received antimalarials*	Community Management of the Sick Child

*variations on these indicators (records disease cases in last month versus past two weeks) are recorded as part of the CBSS.

Recommendation 23.
As a corollary to #21 there should be a system for engaging the community in tracking outcomes. The health team of community leaders (as defined in the Sustainability Framework, point #2) should be given the opportunity to identify measurable indicators and receive help from the project to monitor and report the indicators. At least in the beginning a community should only tackle one indicator at a time. One community may choose to track the use of bed nets, while another tracks vaccination rates. The community leaders should be given the choice of what they want to monitor. This is an important aspect of critical thinking and ownership on the part of community leaders. There should be a mechanism for tracking progress on a chart that everyone can see.

Response 23.

As previously described under Response 17, coordination workshops will be organized with participation from key stakeholders in each village to strengthen overall collaboration among a village level health team including HC staff, village leaders, VHSG, and RCVGs. The agenda for these one-day workshops among the village level health team will be to discuss roles and responsibilities, as well as goal setting, and activity planning. A graphic progress tracking system will be suggested to RCVGs and other health stakeholders.

B. The Action Plan Table

See following page.

Fiscal Years 2007-2008

ICH Action Plan Overview and Operating Environment Calendar

Activities	Fiscal Year 2007												Fiscal Year 2008											
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
Overview																								
1. Training of project staff	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		
2. Village-based training of RCVGs/home visits to mothers	CDD	ARI	ARI	ARI	EPI	EPI	BF	BF	BF	BF	BF	BF/NUT	NUT	NUT	ANC	ANC	CDD	VitA	VitA	MA	MA	ARI	ARI	
3. BCC Team community mobilization activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4. Quarterly progress review meetings and reports	X			X			X			X			X			X			X			X		
5. Stakeholder coordination	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6. Supportive supervision, field support, and joint monitoring	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7. Final evaluation																							X	X
Operating Environment Calendar																								
1. Rainy season (June- October)	X								X	X	X	X	X								X	X	X	X
2. Hot season (February- May)					X	X	X	X									X	X	X	X				
3. Diarrhea season (follows rainy and hot seasons)																								
March-April and June-December	X	X	X			X	X		X	X	X	X	X	X	X			X	X		X	X	X	X
4. Malaria season (follows rains)																								
June-August and December-January			X	X					X	X	X				X	X					X	X	X	
5. HC Vitamin A and de-worming outreach (MoH schedule)																								
March and November		X				X								X				X						

Detailed Activities by Intermediate Result

Interventions: MNC (10%), BF (20%), NUT (15%)

SO1: Improved Nutritional Status of children under 2

IR1.1: Improved care of pregnant women

IR1.2: Increased early and exclusive breastfeeding

IR1.3: Improved use of complementary foods

Major Activities	Fiscal Year 2007												Fiscal Year 2008											
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
1.1 Implement alternative growth monitoring strategy		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.2 Breastfeeding strategy development			X	X	X	X																		
1.3 Breastfeeding strategy implementation						X	X	X	X	X	X													
1.4 Breastfeeding follow-up							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.5 Nutrition training and refreshers												X	X											
1.6 ANC refresher															X	X								

Interventions: EPI (15%), Vit A (10%)

SO2: Improved Immunization Rates

IR2.1: Improved routine immunization rates

IR2.2: Improved Vitamin A coverage

IR2.3: Improved community participation in immunization

Major Activities	Fiscal Year 2007												Fiscal Year 2008											
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
2.1 Village-based refresher training in immunization				X	X	X																		
2.2 Follow-up with mothers to take children for immunization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.3 HC meetings for localized planning support fixed-site strategy				X																				
2.4 Support immunization fixed-site strategy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.5 Vitamin A refresher																		X	X					

Interventions: CDD (10%), PCM (10%), Malaria (10%)

SO3: Enhanced Community Prevention and Management of the Sick Child

IR3.1: Improved home management

IR3.2: Early identification and referral for danger signs

IR3.3: Improved malaria prevention

Major Activities	Fiscal Year 2007												Fiscal Year 2008										
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
3.1 Acute-Respiratory Infection TOT		X																						
3.2 Acute-Respiratory Training to RCVGs		X	X	X																				
3.3 Diarrhea refresher (ORS and handwashing demonstrations)	X	X	X	X	X	X																		
3.4 Community-based BCC activities focusing on diarrhea	X	X	X	X	X	X																		
3.5 Subsidized-selling of LLINs			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.6 Free distribution of LLINs to very poor families with U2s				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.7 Malaria refresher																				X	X			
3.8 Scale-up DTK pilot to all 254 villages*			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.9 Village-base evaluation on diarrhea prevention and control							X																	
3.10 Scale-up and implement CBSS			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

*pending comodity availability from PSI

Interventions: Local Capacity Building (integrated)

SO4: Improved Partner Project Management Capacity

IR4.1: Improved coordination with health community

IR4.2: Improved project management policies and skills

Major Activities	Fiscal Year 2007												Fiscal Year 2008										
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
4.1 OD/HC workshops to improve coordination	X			X																				
4.2 Coordination workshop TOT				X																				
4.3 HC-based stakeholder coordination workshops				X	X	X	X																	
4.4 Engagement of village leaders (testimonials, meetings, eval.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.5 Management and field support intensification	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.6 Practical leadership training workshops for RCVLs/VHSGs						X	X																	
4.7 Partcipatory learning training program	X			X	X				X						X						X			
4.8 Refresher training on Code of Conduct and 7 Principles	X								X						X						X			
4.9 Branch sustainability planning workshop						X																		
4.10 Technical resource sharing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.11 On-the-job training and capacity building	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.12 Adult learning, communication and volunteer manag. training	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							

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[1] Kolesar R, Keng B., *Siem Reap Integrated Child Health: Formative Research for Understanding Effective Communication for Immunization and Vitamin A Demand Creation*. American Red Cross; Oct 2005.
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[3] Prochaska J, DiClemente C., The Transtheoretical Approach: Crossing Traditional Boundaries of Therapy. Dow Jones Irwin, Homewood, IL; 1984.
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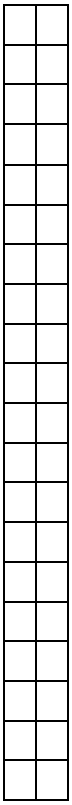

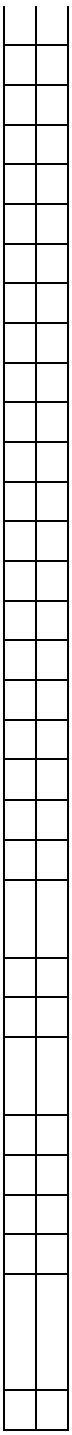

Attachment A: Baseline Information from DIP

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
Strategic Objective One: Improved nutritional status of children under two									
growth monitoring	percentage of children aged 0-59 months who are less than 2 standard deviations below the median height-for-age of the reference population	36.0%		n/a	n/a		n/a	n/a	
growth monitoring	percentage of children aged 0-23 months who are less than 2 standard deviations below the median weight-for-age of the reference population	35.7%	25.0%	n/a	n/a		n/a	n/a	
Intermediate Result: Improved care of pregnant women									
	percentage of children 0-23 months who were born at least 24 months after the previous surviving child	42.1%		n/a	n/a		n/a	n/a	
antenatal care	percentage of women with 2 or more ANC visits	59.9%		n/a	n/a		n/a	n/a	
tetanus toxoid 2	percentage of women receiving at least two tetanus toxoid injections before the birth of their last child	59.9%	90.0%	n/a	n/a		n/a	n/a	
careseeking behavior	percentage of women who can recognize three or more danger signs of pregnancy	n/a		n/a	n/a		n/a	n/a	
	percentage of women counseled at least 2 times during pregnancy by a community care group	n/a		n/a	n/a		n/a	n/a	
	percentage of births attended by skilled health personnel of mothers who received appropriate community counseling visits	n/a		n/a	n/a		n/a	n/a	
	percentage of children age 0-11 months whose births were attended by skilled health personnel	15.3%	25.0%	n/a	n/a		n/a	n/a	

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
	number of home deliveries not attended by skilled health personnel	85		n/a	n/a		n/a	n/a	
Intermediate Result: Increased early and exclusive breastfeeding									
initiation	percentage of children breastfed within the first hour of delivery	42.8%	60.0%	n/a	n/a		n/a	n/a	
initiation	percentage of children breastfed within the first day of delivery	15.7%		n/a	n/a		n/a	n/a	
initiation	percentage of children given other fluids prior to initiation of breastfeeding	100.0%		n/a	n/a		n/a	n/a	
exclusive breastfeeding	percentage of children exclusively breastfed for six months	21.4%	25.0%	n/a	n/a		n/a	n/a	
exclusive breastfeeding	percentage of children 0-5 months exclusively breastfed during the last 24 hours	38.4%		n/a	n/a		n/a	n/a	
	percentage of women counseled within one day of delivery by community care group	0.0%		n/a	n/a		n/a	n/a	
Intermediate Result: Improved appropriate use of complementary foods									
complementary foods	percentage of children age 6-9 months who received breastmilk and complementary foods within the last 24 hours	81.7%	95.0%	n/a	n/a		n/a	n/a	
complementary foods	percentage of children 12-23 months who ate three or more food groups within the last 24 hours	n/a		n/a	n/a		n/a	n/a	
complementary foods	percentage of mothers who complete CVCG nutrition education sequence	n/a		n/a	n/a		n/a	n/a	

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
complementary foods	percentage of mothers who can name five or more vitamin A-rich foods	n/a		n/a	n/a		n/a	n/a	
Strategic Objective Two: Improved Immunization Rates									
full immunization	percentage of children 12-23 months who are fully vaccinated before first birthday	34.0%	80.0%	n/a	n/a		n/a	n/a	
full immunization	percentage of households with yellow cards	n/a		n/a	n/a		95%	93%	98%
Intermediate Result: Improved routine immunization rates									
routine immunization	percentage of children 12-23 months who received a measles vaccine	88.8%	100.0%	n/a	n/a		n/a	n/a	
routine immunization	percentage of children 12-23 months who received DPT3 vaccination	68.8%		n/a	n/a		n/a	n/a	
routine immunization	percentage of children 12-23 months who received 3 polio vaccinations	52.4%		n/a	n/a		n/a	n/a	
routine immunization	percentage of children 12-23 months who received BCG vaccinations	87.1%		n/a	n/a		n/a	n/a	
Intermediate Result: Improved Vitamin A coverage									
child VAC	percentage of children less than 23 months who received a VAC dose	48.3%	95.0%	n/a	n/a		n/a	n/a	
pregnant women VAC	percentage of post-partum women who received VAC dose within 8 weeks of delivery	n/a		n/a	n/a		n/a	n/a	
Intermediate Result: Improved community participation in immunization									

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
	percentage of eligible children vaccinated in campaign	n/a		n/a	n/a		n/a	n/a	
	percentage of eligible children with household marker	n/a		n/a	n/a		n/a	n/a	
	number of village health support groups operational	n/a		n/a	n/a		254	254	100%
	number of children brought to health center outreach sessions	n/a		n/a	n/a		n/a	n/a	
	number of health center outreach sessions	n/a		n/a	n/a		696	457	66%
Strategic Objective Three: Enhanced Community Prevention & Management of Sick Child									
overall prevalence	percentage of children with symptoms of illness (cough, diarrhea, fever) during the last two weeks	65.0%	40.0%	n/a	n/a		n/a	1023	
	number of cases of childhood illnesses referred appropriately to health center in the last month	n/a		n/a	n/a		501	345	69%
Intermediate Result: Improved caregiver knowledge of childhood illnesses									
community outreach	percentage of mothers age 0-23 months who know at least 2 signs of childhood illness that indicate the need for treatment	57.9%	90.0%	n/a	n/a		n/a	n/a	
	can cite at least 2 ways of reducing risk of HIV infection	59.0%		n/a	n/a		n/a	n/a	
	number of mothers who complete related community care group health education sequence - Epi & Vit A	n/a		n/a	n/a		105684	58071	55%

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
	number of mothers who complete related community care group health education sequence - ANC	n/a		n/a	n/a		105684	58071	55%
	number of mothers who complete related community care group health education sequence - malaria sequence	n/a		n/a	n/a		34845	30523	88%
	number of mothers who complete related community care group health education sequence - diarrhea sequence	n/a		n/a	n/a		34845	25736	74%
	percentage of mothers who can name any signs of childhood illness - high fever	69.5%		n/a	n/a		138	86	62%
	percentage of mothers who can name any signs of childhood illness- convulsions	25.9%		n/a	n/a		138	54	39%
	percentage of mothers who can name any signs of childhood illness- simple diarrhea	55.9%		n/a	n/a		125	76	61%
	percentage of mothers who can name any signs of childhood illness- severe diarrhea	55.9%		n/a	n/a		125	49	39%
Intermediate Result: Improved caregiver home management of childhood illnesses									
careseeking behavior	percentage of sick children age 0-23 months who received increased fluids and continued feeding during an illness in the last two weeks	53.7%	70.0%	n/a	n/a		81	54	67%
careseeking behavior	percentage of mothers of children 0-23 months who seek care for their child with cough or fast/difficult breathing in the last 2 weeks	67.0%	80.0%	n/a	n/a		135	76	56%
careseeking behavior	percentage of mothers of children 0-23 months who seek care for their child with severe diarrhea in the last 2 weeks	70.0%	80.0%	n/a	n/a		108	135	125%

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
careseeking behavior	percentage of mothers of children 0-23 months who seek care for their child with fever in the last 2 weeks	57.1%	75.0%	n/a	n/a		258	134	52%
Intermediate Result: Improved prevention & treatment of childhood illnesses									
diarrhea	percentage of mothers with children age 12-23 months who report that they wash their hands with soap/ash at all appropriate moments in the previous day	0.6%	100.0%	n/a	n/a		n/a	n/a	
diarrhea	number of cases of diarrhea in the last month	n/a		n/a	n/a		n/a	n/a	
diarrhea	percentage of children age 0-23 months who had diarrhea during the last two weeks	35.0%	30.0%	n/a	n/a		n/a	n/a	
diarrhea	percentage of children age 0-59 months who had diarrhea and were treated with ORT	32.2%		n/a	n/a		522	224	43%
diarrhea	number of cases of cough or rapid/difficult breathing during the last month	n/a		n/a	n/a		n/a	n/a	
diarrhea	percentage of children age 0-23 who had rapid/difficult breathing during the last 2 weeks	19.0%		n/a	n/a		n/a	n/a	
malaria	percentage of children age 0-23 months who slept under a LLIN the previous night	1.7%		n/a	n/a		n/a	n/a	
malaria	number of cases of fever during the last month	n/a		n/a	n/a		n/a	n/a	
malaria	percentage of children age 0-23 who had fever during the last 2 weeks	38.0%		n/a	n/a		n/a	n/a	
Strategic Objective Four: Improved Partner Project Management Capacity									

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
	improvement on organizational capacity assessment key elements/findings as detailed below	0							
	Code of conduct	0		1	1	100	n/a	n/a	
	Workplan (monthly)	0		1	1	100	8	8	100%
	M&E plan (quarterly review)	0		1	1	100	2	2	100%
	Customer satisfaction survey	0		1	n/a		100	98	98%
	number of active volunteers	430		2630	n/a		1959	1985	101%
Intermediate Result: Improved coordination with health community									
	number of joint trainings held	0		n/a	n/a		12	12	100%
	percentage of meetings held with MOH initiated by CS management team	0		4	8	200	4	4	100%
	attendance record at monthly OD meetings	0		3	3	100	3	3	100%
	number of meetings held with MOH	0		6	8	133	3	3	100%
	number of working group meetings attended	0		2	2	100	3	2	67%

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
	number of working group memberships	0		2	1	50	2	1	50%
	number of professional papers or peer reviewed publications	0		0	0	0	2	2	100%
Intermediate Result: Improved project management policies and skills									
	number trained in reporting procedures according to M&E guidelines	0		n/a	n/a		5	5	100%
	percentage of project activity reports turned in correctly and on-time	0		n/a	n/a		100	100	100%
	number of project activity reports turned in on-time	0		n/a	n/a		3	3	100%
	number trained in project activity reporting procedures	0		n/a	n/a		4	4	100%
	percentage of finance reports turned in correctly and on-time	0		n/a	n/a		n/a	n/a	
	number of finance reports turned in, completed correctly	0		n/a	n/a		3	3	100%
	number trained in finance reporting procedures	0		n/a	n/a		2	2	100%
Intermediate Result: Improved CRC volunteer network									
	number of new volunteers recruited for project	0	221800.0%	n/a	n/a		2016	1985	98%

				Year 1			Year 2		
strategy element	performance indicator	baseline value (N or %)	EOP: target	Planned target (N or %)	Actual (N or %)	% of Target Met	Planned target (N or %)	Actual (N or %)	% of Target Met
	percentage of volunteers retained for more than one year	0	90.0%	n/a	n/a		n/a	n/a	
pro-active home visits	number of proactive home visits	0		n/a	n/a		n/a	84975	
pro-active home visits	percentage of volunteers completing home visits per project guidelines	0		n/a	n/a		n/a	1985	
pro-active home visits	number of communities in which home visits occur	0		n/a	n/a		254	254	100%
	number of community mobilization activities	0		n/a	n/a		n/a	24	
	volunteer participation in monthly reporting meetings	0		n/a	n/a		3970	1806	45%

NB: EOP targets were revised following MTE

ATTACHMENT B: Evaluation team members and their titles

Team Member	Title
Richard Crespo	Lead Evaluator
American Red Cross	
Sujata Ram	Maternal Child Health Advisor
Robert Kolesar	ICH Project Officer
Minal Amin	Southeast Asia Program Officer
Sor Sara	Project Coordinator
Chhun Sona	ICH M&E Officer
Pen Monorom	ICH Technical Training Officer
Tep Sokunthea	ICH Admin/Finance Officer
Hel Kim Man	ICH Senior Driver
Ou Savouen	ICH Driver/Translator
Kheng Bunny	ICH Data/entry clerk
Cambodian Red Cross	
Ros Sovanna	ICH Project Manager
Phoung Sam On	ICH Operation Manager
Roth Rumnea	ICH Operation Manager
Leang Sok Chan	ICH Field Officer
Kong Loeum	ICH Field Officer
Krogh Soan	ICH Field Officer
Ean Kang	ICH Field Officer
Pech Sophat	ICH Field Officer
Soung Sar	ICH Field Officer
Ouch Yorn	ICH Field Officer
Oun Eat	ICH Field Officer
Nhek Vissoth	ICH Field Officer
Oeung Phally	ICH Field Officer
Vat Kim Hen	ICH Field Officer
Chhorn Pong	ICH Field Officer
Koy Bunny	ICH Field Officer
Phoeun Chhy	ICH Field Officer
Kem Voeurn	ICH BCC team member
Sok Nith	ICH BCC team member
Sok Vichea	ICH BCC team member
Am Sony	ICH Logistic support for the MTE
USAID	
Hen Sokun Charya, MD	Family Health Team Leader, Office of Public Health, USAID Cambodia

ATTACHMENT C: Evaluation assessment methodology

Data Collection Process

The mid-term evaluation for the ICH Project used a participatory approach. The lead evaluator engaged the whole project team in the evaluation process. The first step was to involve the whole team in planning the evaluation. This was accomplished in a three-day workshop with the participation of the whole staff team, the ARC Maternal Child Health Advisory, the ARC Southeast Asia Program Officer and the USAID MCH/RH Development Assistance Specialist. The workshop was used to first decide what to evaluate and then second, plan how to evaluate.

The lead evaluator began by reviewing the USAID mid-term evaluation guidelines. Within the framework of the guidelines he asked the project team to identify what they had done up to this point, including the things that were still in process. As an individual identified an activity it was written on a flip chart. The whole group was then asked to list the indictors that could verify that activity. In a large group discussion format the lead evaluator went around the room asking project team members to identify an activity and list indicators. The result was a long series of flip chart pages with activities and indicators that could verify each one.

The flip chart pages were then organized into evaluation topics and placed together on a wall of the meeting room. The project team was divided into small groups and each group was assigned an evaluation topic. The task of the small groups was to plan how they would collect information about that topic. In preparation for this task the lead evaluator gave them a framework for their task. They were asked to identify who, or what group of people (i.e. mothers, health center staff, village leaders, etc) could contribute information about the topic. For each group they then made a list of questions about the evaluation topic.

For example, one evaluation topic was malaria prevention and control. The small group in charge had before them all the project's activities related to malaria along with a list of indicators for verifying the activities. They decided that mothers, village leaders, CVCGs, VHSGs and health center staff could give them information about the malaria activities. They then made a list of the questions that could be asked of each group. These questions in turn served as the basis for writing survey instruments.

For this task the workshop participants were reorganized into new small groups that were charged with creating a survey for a specific population, e.g. mothers, CVCGs, village leaders, etc. The lead evaluator gave the groups guidelines and directions for writing a survey. He also made the rounds of the groups to give specific instructions.

An important dynamic in this planning process was that the survey instruments were first drafted in the Khmer language as opposed to English. This process makes a significant difference in the cultural competency of the surveys.

As a small group completed a draft of their survey it was reviewed by the lead evaluation and then revised by the group. When a final draft was agreed on it would be typed in Khmer. A final step was to review each of the survey instruments in a session with the whole group.

The final step in the workshop was to decide on the interview sample for each research population. For mothers and CVCGs and village leaders the method was as follows. The project staff was organized into three teams, one for each district. In each district an interview team would begin in the third village on main road out of the district center and proceed to interview people in each village along the road. They were to do interviews in two villages per day; one in the morning and another in the afternoon. In each village their goal was to interview at least ten mothers, six CVCGs and one leader. When these goals were met they could proceed to the next village. When the team came to a health center they would interview the staff at that center.

In actuality the teams were able to interview many more villages and people than anticipated. Most teams interviewed four to five villages per day, instead of the two that were planned. As a result the teams were able to interview 288 mothers, 242 CVCGs, 90 village leaders, and staff at twelve of the fifteen health centers.

Data Analysis Process

Data analysis was done in a participatory mode. The lead evaluator and the project's M&E director created data recording sheets in MS Excel for each survey. The whole staff met for three days to enter data, calculate results and make tables and graphs of the finding. For data entry, the data sheets were loaded on six lap tops and the staff members were organized into teams around the computers. After the data were entered Excel was used to calculate totals, percentages and averages. The teams took these results and put them into tables and graphs.

Developing Conclusions and Recommendations

A third workshop was held for articulating conclusions, making recommendations and writing action plans. Participants from the OD and Provincial MOH and the national CRC office participated along with the project team. Using small group processes the workshop participants were organized into small teams. Each team was assigned the a research population. The teams used the tables and graphs from the data analysis process to make a list of things that were going well, things that were making moderate progress and things that were not going well. Each group presented their conclusions to the whole group for discussion and clarification. Following this interaction the small groups met again to make recommendations.

The final step was for the ICH Project team to meet in their work groups, i.e. the operations managers and their respective team of field officers, the BCC team and technical advisory team. Each work group took the relevant findings and recommendations and wrote an action plan. They used the format of discussion planning ideas and writing the plans on a flip chart sheet so that everyone in the group see and track the development of the action plans.

ATTACHMENT D: List of persons interviewed and contacted

Individual or Group Member	Title
ARC Washington DC-based project staff	
Sujata Ram	Maternal Child Health Advisor
Mark Preslan	Regional Director, Asia/Europe
ARC Cambodia country-based project staff	
Robert Kolesar	ICH Project Officer
Sor Sara	ICH Project Coordinator
Chhun Sona	ICH M&E Officer
Pen Monorom	ICH Technical Training Officer
Edward Shea	Senior Regional Representative, Southeast Asia
Cambodian Red Cross project staff	
Ros Sovanna	ICH Project Manager
Phoung Sam On	ICH Operation Manager
Roth Rumnea	ICH Operation Manager
Sok Long, MD	Health Department Director
Sum Sam An	Siem Reap Provincial Branch Director
Soung Sar	ICH Field Officer
Chhorn Pong	ICH Field Officer
Kheng Bunny	ICH Data/entry clerk/BCC team member
Sok Nith	ICH BCC team member
Madame Pum Chantinie	CRC General Secretary
242 Red Cross Volunteers	
USAID Cambodia	
Hen Sukun Charya, MD	Family Health Team Leader, Office of Public Health
Community Members	
288 mothers	
90 village leaders	
Ministry of Health	
Staff at 12 health centers	
ICH project staff	Group interview

Understanding Immunization and Vitamin A Communication in Rural Cambodia:

a Formative Research Study

FY-2004 Child Survival and Health Grants Program (CSHGP)
No. GHS-A-00-04-00007-00

Siem Reap, Cambodia
July, 2006

American Red Cross

MINISTRY OF HEALTH

USAID

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Additionally, the following individuals were involved in the technical review and editing of the research protocol, survey tools, and/or draft report: Dr. Hong Rathmony, MOH Communicable Disease Control Department Vice-Director , Dr. Ou Kevanna, MOH National Nutrition Program Director, Mr. Mike Favin, BASICS Immunization Technical Officer, Dr. Kohei Toda, WHO EPI Technical Adisor, Mr. Rosoka Thor, WHO Medical Officer, Dr. Severin von Xylander, UNICEF MCH Project Officer, Mr. Chum Aun, UNICEF EPI Assistant Project Officer, Ms. Jutta Diekhans, Helen Keller International Technical Advisor, and Mrs. Sujata Ram, American Red Cross MCH Technical Advisor. Additionally, the author would like to acknowledge the valuable input and support provided from Mr. John Grundy of the Program for Appropriate Technology in Health (PATH/Cambodia) throughout the research and report writing. Mr. Grundy also provided permission to use a PATH survey tool as part of this study.

Special recognition is also owed to the health center staff, including the directors and outreach staff, whom collaborated with the study team. Their input and ideas related to best practices and lessons learned are invaluable.

Perhaps most importantly, this study is indebted to the participating community leaders, village health support group members, and parents who have shared their views and experiences, thereby helping us to better understand communication to improve delivery of immunization and vitamin A in rural Cambodia.

ACRONYMS AND ABBREVIATIONS

AD	Administrative District
BASICS	Basic Support for Institutionalizing Child Survival
BCG	Bacille Calmette-Guèrin Vaccine
BTC	Belgian Technical Cooperation
CSHGP	Child Survival and Health Grants Program
CRC	Cambodian Red Cross
CVCG	Community Volunteer Care Group
DHS	Demographic and Health Survey
DTP	Diphtheria, Tetanus, Pertussis Vaccine
DTP-HepB	Diphtheria, Tetanus, Pertussis, Hepatitis B Vaccine
DQA	Data quality audit
EPI	Expanded Programme on Immunization
FGD	Focus Group Discussion
GAVI	Global Alliance for Vaccines and Immunization
HepB	Hepatitis B
HC	Health Center
HKI	Helen Keller International
HMIS	Health Management Information System
HSSP	Health Sector Strategic Plan
ICC	In-country Coordinating Committee
ICH	Integrated Child Health
IDI	In-depth interview
IEC	Information, Education, and Communication
ISS	Immunization Services Support (GAVI funding)
ITN	Insecticide Treated (Bed) Net
KPC	Knowledge, Practices, and Coverage
LLIN	Long-lasting Insecticide (Treated Bed) Net
M&E	Monitoring & Evaluation
MOH	Ministry of Health
MPA	Minimum Package of Activities
NGO	Non-Governmental Organization
NCHADS	National Center for HIV/AIDS, Dermatology and STDI
NIP	National Immunization Program
OD	Operational Health District
OPV	Oral Polio Vaccine
PHD	Provincial Health Department
PATH	Program for Appropriate Technology in Health
RACHA	Reproductive and Child Health Alliance (local NGO)
SIA	Supplemental Immunization Activity
TBA	Traditional Birth Attendant
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VHSG	Village Health Support Group
WHO	World Health Organization

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I. Executive Summary

Background
Immunization and Vitamin A are relatively successful public health programs in Cambodia. The number of children being immunized against seven preventable diseases has increased over the past six years. Vitamin A coverage has dramatically increased over that same time period. However, from 2004 to 2005 routine service statistic coverage estimates for BCG, DPT3, measles, polio3, and vitamin A have stagnated.

As vaccination rates approach their 80-percent targets, remaining pockets of unvaccinated children typically become more difficult to reach. Well-developed and targeted communication strategies can play an increasingly important role in achieving and maintaining coverage targets.

The development of an effective behavior change communication strategy requires an in-depth understanding of the many stakeholder viewpoints, perceptions, and norms. There is considerable evidence that focused messages to inform parents about where and when to go for complete immunization is the most important and effective communication strategy.[1] However, it is critical to understand the social-communication environment for maximum effectiveness of both community mobilization and interpersonal communication approaches.

Study objective and design
The study's primary objective is to inform the development of a communication strategy to improve immunization coverage in Angkor Chum Operational Health District while supporting the National Immunization Program's efforts to enhance national level programming.

The study was designed in collaboration with various stakeholders. Five modules were developed focusing on different aspects of vaccination and vitamin A service delivery including: (1) best practices and system constraints, (2) communications, (3) inter-personal communications, (4) barriers, and (5) key benefits and messaging. Data collection methods included in-depth interviews, service delivery observation, convenience sample, and focus group discussions.

Findings
Interpersonal communication with each mother through home visits is a critical factor to motivate immunization-seeking behavior and achieve high coverage. However, village leaders and VHSGs do not have time to visit each house. Caregivers want to be reminded in their home about health center outreach one day prior to service. Caregivers also report that they often share information about health center outreach sessions with their family and neighbors once they learn about it. Buddhist monks and nuns, as well as schoolteachers, are highly respected community members; however, their participation in promoting immunization services is presently limited.

[1] Rasmuson M. HEALTHCOM Project, *Sustaining EPI: What Can Communication Do?*, 1990.

Advance notification of the outreach schedule to the village varies and is often not adequately timed so as to permit proper dissemination of information throughout the village by VHSGs and village leaders.

Health center and outreach staff consider their primary achievement to be the completion of "full coverage." By contrast, village leaders and VHSGs had difficulty identifying their achievements. Additionally, immunization record keeping in the village is a critical factor as this information permits both village leaders and VHSG to easily identify those households needing follow-up.

Good planning and cooperation, as well the development of a positive relationship with villagers, village level volunteers, and village leaders, as identified by health center staff, is also critical to ensure high immunization coverage. However, roles and responsibilities of immunization stakeholders is not clear or well understood, thus limiting their potential in promoting immunization services

As most births occur in the village, the administration of the Hepatitis B (HepB) birth dose is challenging. Furthermore, the traditional practices of *"ang-pluhgn*" or អាំង ភ្លើង and "*chrab chewan*" or ច្រាប ជាន់ deter post-partum women from going to the health center or outreach services for seven days following childbirth. There is no uniform system for tracking and reporting newborns to the health center. Key immunization stakeholders agree that the HepB birth dose should be administered by health center outreach staff (midwives).

Outreach staff consider their most important achievement to be their contribution to the development of the village leaders' strong belief that vaccinations are important. This conviction was corroborated when talking with village leaders as they consistently demonstrated an extremely positive perception of vaccinations. Village leaders commonly reported that people in their village no longer suffer from different illnesses such as measles and night blindness. However, the benefits of tetanus toxoid (TT) are not well understood among caregivers; TT coverage rates among pregnant women are low.

Some health centers offer free health services to VHSGs and village leaders as an incentive for collaboration. This is a highly valued and appreciated benefit.

Outreach sessions are almost exclusively focused on immunization services and vitamin A distribution (during expanded outreach). The growth-monitoring chart on the back of the yellow card immunization record is not used. Outreach staff report they do not have enough time to provide health education or growth-monitoring during outreach sessions.

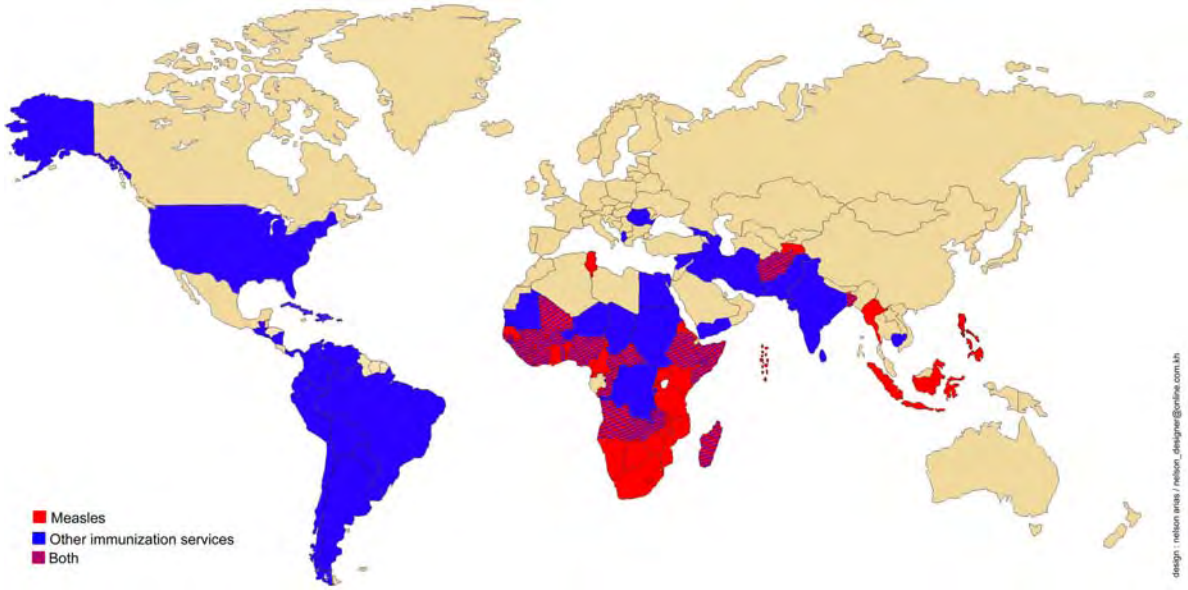
Health center outreach staff did not directly observe oral ingestion of mebendazole distributed during expanded outreach. This task was not assigned to village leaders, VHSG member, or village-based volunteers. It is not clear how many children provided with mebendazole consumed the medication.

II. Red Cross involvement in vaccination efforts worldwide

Mobilizing around the world

The Red Cross has been an active partner in the global effort to control vaccine-preventable diseases. Red Cross and Red Crescent national societies in at least 80 countries, working closely with their respective interagency coordinating committees (ICCs), have supported a variety of immunization activities, primarily through their extensive networks of volunteers at the local level. Red Cross volunteers have been instrumental in mobilizing communities to improve turnout for supplemental immunization activities (SIAs) as well as routine vaccination outreach services. Several Red Cross national societies are also involved in vaccination provision and cold chain support. Annex F includes a summary of immunization activities by country.

Figure 1. Red Cross and Red Crescent participation in vaccination efforts (2000 - 2006)



Additionally, the Red Cross has demonstrated the potential of increasing vaccination coverage by linking insecticide-treated bed net distributions to measles campaigns when appropriate.[2,3] As insecticide-treated mosquito nets protect children from malaria infection, this equity-based innovation has the added benefit of saving one life per year for every six insecticide-treated bed nets distributed.[4]

[2] Grabowsky M et al. Distributing insecticide-treated bednets during measles vaccination: a low-cost means of achieving high and equitable coverage, Bull WHO 2005;83:195-201
[3] American Red Cross and the CORE Group, Partnerships in Action: An Integrated Approach to Combining a Measles Campaign with a Bed Net,Vitamin A and Mebendazole Campaign in Zambia, July 2004
[4] Lengeler C. *Insecticide treated bednets and curtains for preventing malaria,* Issue 2, 2004

Measles

Measles is one of the leading vaccine-preventable childhood killers in the world. In 2004, it was estimated that there were 454,000 measles deaths globally, which translates to more than 1,200 deaths every day; 50 people die every hour from measles. The overwhelming majority of these deaths, that is 410,000 out of 454,000, are children under the age of five who, often die from secondary complications related to pneumonia and diarrhea.

A safe and highly effective vaccine has been available for more than 40 years. It costs less than US $1 to protect a child against measles, making measles vaccinations one of the most cost-effective public health interventions available for preventing deaths. Despite this, millions of children still remain at risk.

The Measles Initiative

The Measles Initiative partnership, launched in 2001, is a long-term commitment among public health leaders to support the goal of reducing measles deaths globally by 90 percent by 2010.

Largely attributable to the technical and financial support of the Measles Initiative and the commitment from many African governments, 213 million children have been vaccinated against measles, and 1.2 million lives have been saved since 1999. The initiative also supports integrated child health campaigns in which health workers provide not only measles vaccines, but also insecticide-treated nets for malaria prevention, vitamin A, de-worming medication, and polio vaccines.

Since 2001, the Measles Initiative has mobilized more than $150 million and supported high-quality measles campaigns in more than 40 African countries as well as in three Asian countries. As a result, global measles deaths have dropped by 48 percent--from 871,000 in 1999 to an estimated 454,000 in 2004. The largest reduction occurred in Africa, the region with the highest burden of the disease, where estimated measles cases and deaths dropped by 60 percent.

The American Red Cross leads the U.S.-based partnership. Key coalition partners include the United States Centers for Disease Control and Prevention (CDC), the United Nations Foundation (UNF), United Nations Children's Fund (UNICEF), the World Health Organization (WHO), and the International Federation of Red Cross and Red Crescent Societies (Federation).

The American Red Cross assists national Red Cross societies by providing technical assistance and financial support to build their local capacity to mobilize and recruit volunteers, including strengthening volunteer networks and improving operating systems. Since the formation of the measles partnership, the American Red Cross has contributed US$10 million in core funding to the effort. The organization has earmarked an additional $62 million to expand immunization activities to tsunami-affected countries.

The American Red Cross core areas of involvement in the measles initiative have been to:

- ► Lead and sustain the US-based coalition of the global measles partnership;
- ► Attract substantial financial and technical resources to the coalition;
- ► Ensure involvement of national Red Cross/Red Crescent societies;
- ► Integrate measles with other initiatives.

Red Cross and Red Crescent national societies coordinate with their respective ministries of health to implement country-level vaccination campaigns and are the primary forces behind social mobilization. Social mobilization ensures that all children get to the vaccination sites. It includes community activities and house-to-house visits by Red Cross volunteers.

The Federation provides technical support and coordination to national societies and advocates for measles outside the United States.

The incredible success of the measles partnership has resulted in the planned expansion of activities into Asia where the high total of measles deaths ranks second only to sub-Saharan Africa. The measles partnership will expand support in the World Health Organization's 47 priority countries to support the Global Immunization Vision and Strategy. The initiative will heavily focus on the three countries that account for the majority of global measles deaths: India, Pakistan, and Nigeria. Countries with planned measles initiative activities in 2006 are included in Figure 1 above.

Mobilizing in Cambodia

Presently, the American Red Cross is providing technical and financial support to the Cambodian Red Cross (CRC) to implement an Integrated Child Health (ICH) Project in the Pourk, Angkor Chum, and Varin Districts of Siem Reap Province. The ICH Project, funded by the United States Agency for International Development (USAID), is working alongside the ministry of health and numerous non-governmental organizations to reduce infant and child morbidity and mortality. The ICH Project focuses on the child survival "scorecard" interventions identified as priorities during the December 2004 National Child Survival Partnership Workshop in Phnom Penh, Cambodia. These interventions have been demonstrated to have the greatest impact on child mortality[5] and include increasing vaccination coverage rates. This is being achieved by focusing on improved community participation and turnout for routine health services. Additionally, the ICH Project will link long-lasting bed net distribution to immunization services for pregnant women with the aim of improving tetanus toxoid coverage.

[5] Jone G, Steketee R, Black R, Bhutta ZA, Morris SS, How many child deaths can we prevent this year? *The Lancet* Vol 362, July 5, 2003

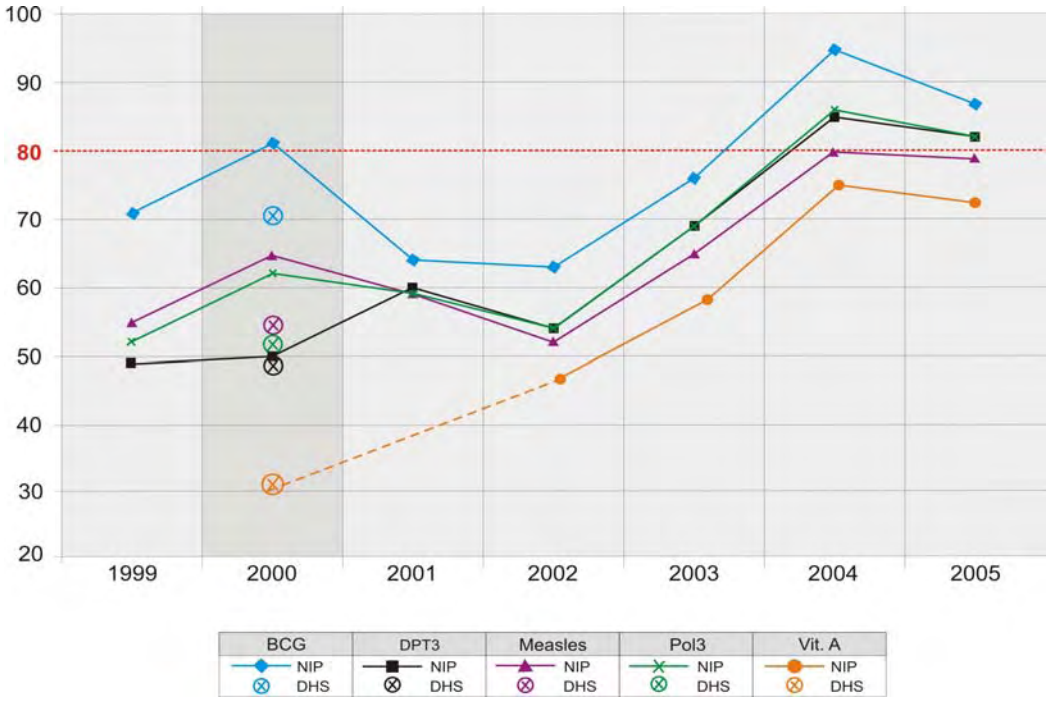
III. Cambodia Situational Analysis

Overview

Both immunization and vitamin A are relatively successful public health programs in Cambodia. Recent achievements of the National Immunization Program (NIP) include eradication of polio, a reduction in reported measles cases, and the introduction of a combined hepatitis B-DTP (*DTP-HepB*) vaccine.[6] The number of children being provided with vitamin A and immunized against seven preventable diseases has increased over the past six years.

Immunization coverage targets set out in the *Health Sector Strategic Plan 2003-2007* aim to fully immunize 80 percent of children below one year of age by 2007. Overall, routine service statistics from the Ministry of Health's National Immunization Program and National Nutrition Program show a trend towards increased coverage. However, routine service statistic coverage estimates for BCG, DPT3, measles, polio3, and vitamin A have reached a plateau at around 80 percent from 2004 to 2005. The graphic below illustrates selected vaccination and vitamin A coverage statistics from 1999 through 2005.

Graphic 1. Vaccination service statistics and DHS survey coverage data



Sources: WHO/UNICEF, Review of National Immunization Coverage 1980-2004, Cambodia, August 2005; National Immunization Program, Annual Workshop on Program Achievement 2005, 16-17 February 2006; Cambodia Demographic and Health Survey 2000; WHO, Western Pacific Region, *Child Survival Profile: Cambodia*, 2006

[6] PATH, Cambodia Child Health Strategy Development, *Delivery Modalities and Systems Constraints*, Immunization, Version: 13 May 2004.

Routine immunization data in Cambodia is considered highly valid. A 2001 data quality audit indicated 83 percent verification of national immunization data (i.e. an 83-percent match between health center data and national level data). By 2003, this figure improved to 98 percent, the second highest in a group of 13 countries studied using this same methodology.[7]

Despite high data quality for routine service statistics, the proportion of the population protected against vaccine-preventable diseases should be estimated using a valid, population-based survey.[8] Routine service statistics, based on facility tallies, frequently overestimate coverage rates. A comparison of immunization coverage estimates for year 2000 reveals that routine service statistics, using the more restrictive indicator of children under 1 year of age, are higher than the population-based demographic and health survey (DHS) for the same year. The latter measured coverage among children 12-23 months (see Graphic 2 on previous page). One would expect the DHS point estimate, using a more inclusive age range, to be the higher estimate.

According to national service statistics for 2005, based on facility tallies, dropout rates are low: 4 percent for OPV 1-3, and 4 percent for DPT 1-3.[9] Correcting for negative dropout rates (adjusting all negative rates to the lowest possible dropout rate of zero, thus assuming that all children completed the course on schedule) puts both rates at 5 percent.

However, seven operational health districts, primarily remote districts, have higher rates in the range of 10 to 22 percent. Dropouts are considered to reflect a problem with service barriers, such as missed opportunities to vaccinate or consumer barriers such as lack of correct information and fear of side effects.[10] Higher dropout rates among remote districts suggest that distance and poverty are important factors related to access. Other research indicates that poor populations are far less likely to be immunized than their urban and better educated counterparts.[11]

The positive trend in immunization coverage and low dropout rates may be attributed to a range of factors. Several key areas have been associated with improved service performance in Cambodia. Over the past several years the National Immunization Program has developed several strategies including the *Monitoring and Management Support Strategy* (June 2003), *Strategy for Training* (November 2003), and the *National Communication Strategy* (July 2004). These strategies outline common agendas and approaches to guide stakeholders as they work to improve vaccination services.

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[7] PATH, Cambodia Child Health Strategy Development, *Delivery Modalities and Systems Constraints*, Immunization, Version: 13 May 2004.
[8] USAID, *Immunization Essentials: A Practical Field Guide*, Chapter 4: Monitoring, Evaluation, and Information Management, October 2003.
[9] National Immunization Program, *Immunization Coverage for Children under 1 year of age by ODs, 2005*, Annual Workshop on National Immunization Program Achievement 2005, 16-17 February 2006.
[10] Rasmuson M. HEALTHCOM Project, *Sustaining EPI: What Can Communication Do?* 1990.
[11] PATH, Cambodia Child Health Strategy Development, Delivery Modalities and Systems Constraints, Immunization, Version: 13 May 2004.

Other positive factors that have been identified as contributing to coverage increases are: (1) secure financing for outreach, (2) performance-based contracts and supportive management, (3) strengthening of local area micro-planning skills, and (4) implementation of local area social mobilization strategies.[12] Additionally, financing through the GAVI Immunization Services Support (ISS) has been credited with enabling (1) Information, Education and Communication (IEC) materials production, (2) supervision and monitoring, and (3) quarterly review meetings. These all have been cited as important contributing factors in recent coverage achievements.[13] Maintenance of these successes is an ongoing challenge.

Other Challenges: Tetanus Toxoid and Wastage

According to national service statistics, only 49 percent of pregnant women, and 19 percent of women of childbearing age have completed TT2+.[14] This reveals a serious need to develop strategies focused on improving tetanus toxoid coverage among women of reproductive age.

In 2005, national wastage rates were high for all seven vaccines: BCG (86 percent), HepB (26 percent), OPV (45 percent), DPT (46 percent), DPT-HepB (33 percent), measles (73 percent), and TT (55 percent).[15] It is recognized that some so-called "wastage" is not wastage at all but rather a predictable and acceptable cost of providing immunization services. One common cause of unavoidable loss of vaccine is reduced or limited vial yield: it is impossible to get all the vaccine out of a multidose vial. For example, a 20-dose vial does not yield 20 doses, but only 17 or 18. However, wastage rates over 20 percent need further investigation as it may indicate repeated instances of lower-than-planned attendance during vaccination sessions or other issues.[16]

Immunization and Vitamin A Service Delivery Mechanisms

Supplementary Immunization Activities are essentially vaccination campaigns. These efforts focus on increasing coverage against a single antigen (e.g., measles or polio). They are generally centralized, vertical, and implemented with high levels of reliable funding. Although this approach proved to be highly effective against targeted diseases, there have been concerns about disruption of routine vaccination services when local human resources are mobilized through centralized planning to focus exclusively on SIAs. Previous recognition of this inherent competition or tension between centralized management for

[12] PATH, Cambodia Child Health Strategy Development, *Delivery Modalities and Systems Constraints*, Immunization, Version: 13 May 2004.
[13] Abt Associates, Inc. *Evaluation of GAVI Immunization Services Support Funding Case Study: Cambodia*, June 2004.
[14] MOH/MCHC/NIP, Annual Workshop on National Immunization Program Achievement 2005, 16-17 February 2006.
[15] MOH/MCHC/NIP, Vaccination Wastage Report for 2005, February 2006.
[16] USAID, *Immunization Essentials: A Practical Field Guide*, Chapter 4: Monitoring, Evaluation, and Information Management, October 2003.

SIAs and decentralized management for routine vaccination services has led to attempts at collaborative activity planning that permits integration of service delivery. When possible, SIAs efforts are now complemented with attempts to vaccinate children against all target diseases.[17] However, the need for targeted, single antigen SIAs, is recognized as a necessary tool to ensure coverage increases for specific antigens.

Outreach is the primary delivery mechanism for immunization and vitamin A in Cambodia 70 to 80 percent of immunization services are provided through outreach sessions from the health centers.[18,19,20] A total of 929 health centers provide regular outreach services to more than 13,000 villages across Cambodia.[21] Villages within one-hour travel distance from the nearest health center receive an outreach visit from health center staff once per month, and those farther than one hour from the health center receive one visit every two months.[22]

Routine outreach activities have been led and resourced sub-nationally through the network of provincial health departments, operational health district offices, and health centers. Many NGOs also provide per diem and travel cost support to health center outreach teams. Despite this piecemeal funding approach for routine outreach services, the ministry of health consistently achieves a high number of annual outreach service contacts/outreach visits in villages. In 2005, the total number of vaccination sessions reported was 176,860; averaging 13.9 sessions per village that year.[23] This represents a 97 percent completion rate of planned sessions.

The NCHADS/URC *Health Facility Assessment in Seven Provinces of Cambodia* confirms high numbers of outreach sessions. Eighty-nine percent of MPA health centers reported monthly community outreach activities in each village of their catchment area.

However, a cursory review of quarterly data shows that outreach EPI activities are not equally distributed throughout the year, suggesting that outreach activities to each village are not conducted on a monthly or bimonthly basis. Likewise, a comparison with vitamin A coverage also suggests that villages are not being followed up through health center outreach activities each month. It would be expected that provision of immunization and vitamin A would be more evenly distributed across each month, as new cohorts of children

[17] PATH, Cambodia Child Health Strategy Development, *Delivery Modalities and Systems Constraints*, Immunization, Version: 13 May 2004.
[18] Abt Associates, Inc. *Evaluation of GAVI Immunization Services Support Funding Case Study: Cambodia*, June 2004.
[19] PATH, *Immunizations and the Introduction of Hepatitis B Vaccine: A qualitative study of Villagers', Health Workers' and Significant Community Members' Knowledge, Attitudes and Practices towards Immunization Services in Komponng Chhnang*, July 2002.
[20] PATH, Cambodia Child Health Strategy Development, *Delivery Modalities and Systems Constraints*, Immunization, Version: 13 May 2004.
[21] PLAN, *Situation Assessment: Health Issues and Health Services in Angkor Thom & Banteay Srey Districts*, Siem Reap Province (October 2004).
[22] *Guidelines for Health Center Outreach Services* (2004).
[23] According to the National Institute of Statistics, Labour Force Survey of Cambodia 2001, the number of villages in Cambodia is 12,739; see http://www.nis.gov.kh/SURVEYS/LFS2001/introduction.htm

need these services, and each village in the catchment areas of the health center are visited by an outreach team.[24]

There has been much discussion about the potential of shifting vaccination services from the village (delivered through outreach) to the health center as a fixed site. Socio-economic factors, poor communication, expectation of outreach visits, and lack of integration between immunization programs and referral systems for child health have all been cited as barriers to the successful implementation of a fixed-site strategy.[25] The table below summarizes the benefits and drawbacks of outreach and fixed-site vaccination services.

Table 1. Benefits and drawbacks of outreach and fixed-site vaccination services

Delivery Mode	Benefits	Drawbacks
Outreach	Services are brought closer to families, increasing access; opportunity for participation in health service delivery from community stakeholders; strengthen community cohesion and social pressure thru group participation.	High costs for per diem and transportation for HC staff; disincentive to HC staff to complete outreach when per diem support is not available.
Health Center / fixed site	Opportunity to immunize children during visits to HC for other reasons (however, must consider that not all children will be vaccinated during any service contact to control wastage); lower wastage rates; increased access to a wider range of services at the HC.	Families may not come as HC is too far, costly, and/or inconvenient; expectation of outreach visit; people may wait in village for outreach.

WHO has funded a fixed-site vaccination pilot to explore its efficiency and effectiveness as an alternative to outreach. Presently, 84 health centers offer fixed-site vaccination services across the kingdom. Health centers providing vaccinations on location are typically located in areas with high population densities. Within the catchment areas of the 83 health centers operating the fixed-site strategy, outreach is still undertaken in 43 percent of villages.[26] These villages are found to be too far (more than 2 to 3 kilometers) to motivate caregivers to come to the health center.

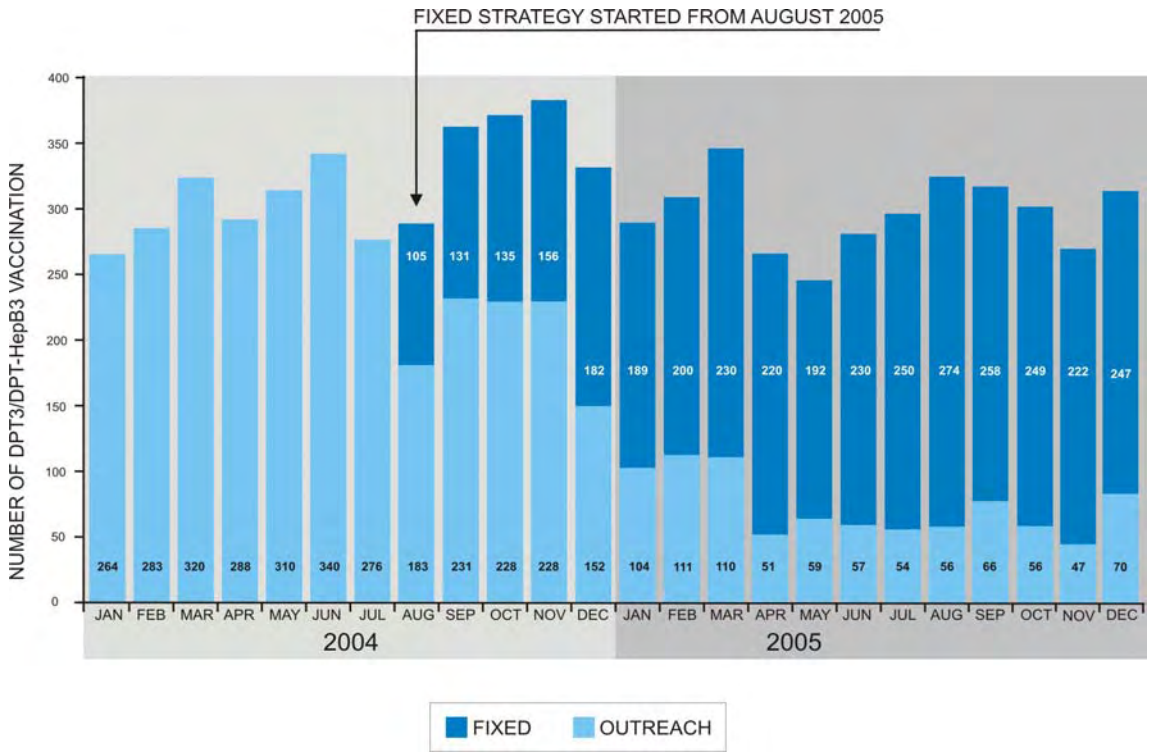
[24] NCHADS and URC, *Health Facility Assessment in Seven Provinces of Cambodia*, 2004.
[25] PATH, Cambodia Child Health Strategy Development, *Delivery Modalities and Systems Constraints*, Immunization, Version: 13 May 2004

[26] National Immunization Programme, Report on Fixed Strategy for Vaccination at Health Centers, NIP Annual Workshop, 16-17 February 2006

The fixed-site strategy focuses on improved coordination and communication between the village and health center through monthly meetings between health center staff and village health support group (VHSG) members. VHSG members and village leaders are responsible for making villagers aware of fixed-site vaccination times and days, as well as ongoing review and follow up of children needing immunization in the village.

Monitoring data indicate that the total number of vaccinations administered both at the village (via outreach) and at the health center (via fixed-site services) are similar to the level of vaccinations administered only through outreach before the pilot project implementation.

Graphic 2. DPT3/DPTHepB3 coverage by delivery modality (fixed and outreach)



Source: National Immunization Program, Annual Workshop on Program Achievement 2005, 16-17 February 2006

Over a 7-month baseline period (January to July, 2004), 11 health centers vaccinated (DPT3/DPT-HepB3) a monthly average of 297 children through outreach. The 11 health centers began implementation of the fixed strategy in August, 2004. From August 2004 through December 2005 the monthly DPT3/DPT-HepB3 vaccinations average was 313 (see graphic 2). Additionally, there is a noticeable increase in the number of vaccinations delivered through the health center compared to the outreach number during that time.

By the end of 2003, 89 percent of all planned health centers (823 of 929) were functioning. The ministry of health aims to improve health care and health equity by providing a basic package of services called the Minimum Package of Activities (MPA) through each health center. The MPA consists of a number of curative and preventive services:

- Primary curative consultation for treatment of the most common health problems, such as malaria, respiratory infections, diarrheal disease, sexually transmitted infections, etc.
- Emergency care and simple (minor) surgery
- Treatment of chronic diseases: tuberculosis, and leprosy
- Consultation for healthy children, including vaccinations, management of malnutrition, prevention of vitamin A deficiency
- Care for pregnant women, including antenatal and postnatal care, vaccination against tetanus, prevention of anemia, delivery, and referral of complicated deliveries
- Birth spacing
- Referral of patients
- Outreach activities

However, due to a lack of qualified staff only 24 percent of these (823) health centers are able to provide the full package of MPA services. Health center understaffing, especially for qualified midwives in the most remote areas, is the most acute problem.[27] Approximately 20 to 25 percent of health centers are without a qualified midwife.[28] This issue has been identified in the Health Sector Strategic Plan 2003-2007.

Other unresolved issues related to human resources include staff motivation, quality of performance, productivity, and distribution by geographical area. Persistent low wages have continuously undermined efforts to improve human resources management and performance in the public sector. Attempts to increase revenue through service fees at public sector referral hospitals and health centers have been unsatisfactory and have had a negative impact on the poor. Since 1996, there has been a 10-percent decrease in the number of midwives and a 5- percent decrease in the ministry of health workforce.[29]

Another system constraint relates to the mostly unfunded operational cost of basic health service provision. This has been shown to negatively affect health managers' and staff members' motivation.[30] Health center contracting arrangements, which pay health centers

[27] PLAN, *Situation Assessment: Health Issues and Health Services in Angkor Thom & Banteay Srey* Districts, Siem Reap Province, October, 2004.
[28] NCHADS/URC, *Health Facility Assessment in Seven Provinces of Cambodia*, 2004.
[29] *Cambodia Child Survival Strategy*, 6.1.06 draft.
[30] Grundy J. personal communication March 20, 2006.

that are able to meet minimum service and quality standards (e.g., complying with operational hours, following the fee schedule, etc.), have shown promising results in mitigating this effect.

Despite these human resource limitations, a 2004 survey of MPA health centers in seven provinces showed that staff knowledge of the immunization schedule for children under one year of age is high: 87.8 percent of staff knew when to give BCG; 98.8 percent knew when to give ORV1/DTC1; and 97.6 percent knew when to give ORV2/DTC2 and ORV3/DTC3. The proportion of MPA health center staff who had the necessary knowledge to fill out the immunization cards for children less than 2 years of age was 79.3 percent.[31]

However, the URC Health Facility Assessment also noted that "less concern is given to reviewing the immunization cards of all children under five years of age that come to the health center, providing immunizations, and updating the card." This suggests missed opportunities for fixed-site vaccination and vaccination communication.

Focus on the Community: Effective Communication

It is widely recognized that increasing community participation can further augment vaccination coverage and cost-effectiveness. Community identification, follow up, and mobilization of caregivers with children needing immunizations can make the most of limited health center staff members' time, permitting them to focus on quality vaccination provision as well as other health services. Effective communication can reduce missed opportunities for vaccination both during outreach and at fixed sites as well as increase information accuracy. This includes dissemination of information on the vaccination schedule as well as the benefits of immunization, thus motivating caregivers to get their children immunized.

As vaccination rates approach their 80-percent targets, remaining pockets of unvaccinated children typically become more difficult to reach. Well-developed and targeted communication strategies can play an increasingly important role to go the last mile in achieving coverage targets. Health communication can also address complex issues of long-term sustainability as well as negative repercussions of high rates (related to reduced concerns about the seriousness of disease).[32] Again, targeted communication strategies can counteract these issues.

Communication for behavior change includes three approaches or channels: mass media, community mobilization, and interpersonal communication. Each approach offers benefits for increasing vaccination coverage. Mass media, such as radio and television advertisements, are generally effective at mobilizing populations and rapidly increasing coverage, particularly when linked with a supplemental immunization activity or campaign. Community mobilization, the engagement of community opinion leaders in the process of

[31] NCHADS/URC, *Health Facility Assessment in Seven Provinces of Cambodia*, 2004.
[32] Rasmuson M. HEALTHCOM Project, *Sustaining EPI: What Can Communication Do?* 1990.

dialogue, planning, and action,[33] creates an enabling environment to empower communities so that they may assume responsibility for sustained demand for vaccination services. Interpersonal communication, including individual and group dialogue, focuses on motivating and negotiating improved health practices with each caregiver. Interpersonal communication is especially effective at identifying each consumer's particular barriers and resistances and developing a personalized solution.

Both community mobilization and interpersonal communication are appropriate and effective approaches to sustain a demand for routine vaccination services, both outreach and fixed-site.

The Cambodian Ministry of Health recognizes the important role of communication within the community. The *Policy on Community Participation in the Development of the Health Center* (2003) describes the primary structure for community participation as the Village Health Support Groups. The VHSG's main role is to ensure the regular flow of information between the community and the health center, including keeping the community informed about health center activities such as vaccination outreach services.

Research suggests that VHSGs are currently functional. Among MPA health centers, nearly four in five (78 percent) report the use of feedback from the VHSGs to monitor and evaluate outreach activities.[34] Furthermore, there are examples of good use of village health volunteers and VHSGs to reach populations in remote and hard-to-reach areas.[35]

However, as VHSGs are made up of only two volunteers per village, there are limitations on their time. Village leaders and community-based health activists including Cambodian Red Cross volunteers may also provide critical support to the VHSG members and village leaders, and HC staff make the maximum use of community participation through village communication networks.

The Cambodian National Immunization Program's *National Communication Strategy (2004*) identifies priority activities for behavior change communication, promotion, and social mobilization. These activities include development and implementation of pilot health-promotion activities specifically targeted to health centers and VHSGs as well as exploration and identification of key partner groups with which to increase health promotion activities. Another NIP priority is increasing community awareness and demand for immunization through IEC activities.

The development of an effective behavior change communication strategy requires an in-depth understanding of the many stakeholder viewpoints, perceptions, and norms. There is considerable evidence that focused messages to inform parents about where and when to go for complete immunization is the most important and effective communication strategy.[36]

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[33] The community mobilization process is also commonly referred to as Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA).
[34] NCHADS/URC, *Health Facility Assessment in Seven Provinces of Cambodia*, 2004.
[35] Sarath Svay, National Immunization Program, National Immunization Review *presentation*, March 2005.
[36] Rasmuson M. HEALTHCOM Project, *Sustaining EPI: What Can Communication Do?* 1990.

However, it is critical to develop an understanding of the social-communication environment to ensure the effectiveness of both community mobilization and inter-personal communication approaches.

IV. Study Objectives

The qualitative study's primary objective is to inform the development of a communication strategy to improve immunization coverage in the Angkor Chum Operational District while supporting the National Immunization Program's efforts to enhance national-level programming.

The study's eight sub-objectives are detailed below.

1. Document best practices, successful approaches, and recommendations implemented by health center directors, outreach teams, village leaders, and village health support groups.
2. Document system constraints for outreach service delivery--especially those related to vaccinations.
3. Map communication channels related to health center outreach and immunization.
4. Document immunization information and messaging that is communicated by health center staff, outreach teams, village leaders, village health support groups, and Buddhist monks.
5. Evaluate inter-personal communication relating to vaccinations by outreach staff during outreach.
6. Understand community perceptions of the benefits of vaccinations and vitamin A as well as motivating factors for seeking vaccinations.
7. Understand community perceptions of the barriers and resistances to child and mother (TT) vaccination both at the health center and during outreach.
8. Assess community recognition of and receptivity to key immunization and vitamin A messages.

V. Definitions

For the purposes of this study, "on-schedule" refers to women or children who have received all required vaccinations per the National Immunization Program policy and schedule. "Not-on-schedule" refers to women or children who are not up-to-date per the policy.

Health Center staff are those people who work primarily in the health center. Outreach staff refers to health center staff whose primary work responsibility is provision of health services to villagers through outreach sessions. VHSG members are ministry of health volunteers who live and work in their own village. Their primary role is to serve as the communication link between the village and the health center.[37]

[37] Ministry of Health, Bureau of Policy, Planning & Health Sector Reform. (February 2003) *Policy on Community Participation in the Development of the Health Center*

VI. Methodology

The methodology section describes the study modules, sampling, recruitment, team training, and logistics, in addition to recording and analysis.

Five modules were developed to collect information relating to research objectives defined above by the research team (see Section X). Qualitative focus group discussions (FGD), in-depth interviews (IDI), purposive sampling, and observation were used. The table below summarizes each module's corresponding target groups, completion rates, and methodology.

Table 2. Research modules, target groups, completion rates, and methodology

Module	Target Groups	Number Plan/Completed	Methodology
1-Best practices, system constraints	1. Health center staff	13 /13	In-depth interviews
	2. Outreach teams	13 /13	
	3. Village leaders	15 /13	
	4. Village health support groups	15 /11	
2-Communications	1. Outreach teams	13 /12	In-depth interviews
	2. Village leaders	15 /15	
	3. Buddhist monks/school teachers	15 /12	
	4. Village health support groups	15 /15	
	5. Caregivers of children <2	30 /31	
3-Interpersonal communication	1. Outreach staff	15 /13	Observation
4-Barriers	1. Female caregivers of children <2 "not on-schedule"	38 /34	Convenience sample
	2. Married men with children <2 "not on-schedule"	38 /18*	
5- Key benefits and messaging	1. Female caregivers of children <2 "on-schedule"	4 /4	Focus group discussions
	2. Female caregivers of children <2 "not on-schedule"	4 /4	
	3. Married men with children <2 "on-schedule"	4 /4	
	4. Married men with children <2 "not on-schedule"	4 /4	

*The reduced number of interviewees was due to difficulty in locating this target group

Modules 1, 2, 3, and 5 are based on guidance found in *Communication for polio eradication and routine immunization: Checklists and easy reference guides* (2002). However, section 2 of Module 1 was copied (with no changes) from the PATH questionnaire originally used as part of "A Qualitative Study of Villagers,' Health Workers' and Significant Community Members' Knowledge, Attitudes and Practices towards Immunization Services in Kompong

Chhnang," *2002*. Module 4 is based on "Guidelines for Community Feedback on Immunization" found in *Increasing Immunization Coverage at the Health Facility Level* (2002). Several questions were repeated in different modules, serving to validate responses through triangulation. English versions of each module are included as Annexes A-E.

Vaccination technical experts from the American Red Cross, the Angkor Chum Operational Health District, BASICS, Helen Keller International, National Immunization Program, the Provincial Health Department, UNICEF/Cambodia, and WHO/Cambodia reviewed draft modules. Individual meetings were held with each organization to solicit technical input. Additionally, a mini-workshop was conducted at the National Immunization Program office in Phnom Penh to review and edit the research protocol including the questionnaires.

The survey tools were pretested in a village near the ICH project office in the Angkor Chum administrative district. All feedback was incorporated into the final survey tools. Other documents consulted in the development of the research protocol and writing of this report are included in Section IX. All modules are included as appendices to this report.

Training

The study team conducted a one-day training on December 19, 2005 that covered a review of qualitative interview skills including facilitation of focus group discussions and note taking. The training also encompassed a review of the study objectives as well as discussion and final editing of the survey tools. The training ended with logistics planning.

Related to Module 3, a two-hour refresher training was completed on the morning of March 6. Following review of the questionnaire, the survey team completed a practice observation in a village near the ICH project office in the Angkor Chum administrative district.

Sample and Logistics

Field-level data collection for modules 1, 2, 4, and 5 was undertaken from December 20-23, 2005. Two four-person teams were accompanied by the research supervisor, one field observer, and two drivers to visit all thirteen health centers in Angkor Chum OD. NIP staff were designated as the team leaders; other team members included professional staff from ARC, CRC, HCs, AD, and the OD. The research team list is detailed in Section X.

The Operational Health District facilitated communication with the health centers to set up a visit schedule and interview times. In addition to visiting each health center, one village from each of the 13 health center catchment areas was visited. Villages were randomly selected to reduce proximity bias.

The teams split up to permit up to four health center visits every day. On the morning of the first day, interviewing and recording tasks were divided among team members for both individual interview and focus group discussions. However, this proved to be too time

consuming. Therefore, interviewing and recording responsibilities were combined for individual interviews.

Each morning and afternoon one sub-team of two people stayed at the health center to interview health center staff and outreach teams. The remaining research team members proceeded to the randomly selected village. After completing interviews at the health center, the sub-team joined the other team members in the village. This permitted each team to visit up to one health center and one village in the morning as well as one health center and one village in the afternoon each day.

Module 3, the outreach staff observation checklist, was completed on March 6 and 16 by the ARC monitoring and evaluation officer, one health center staff and two operational district staff. Two two-person teams were deployed to thirteen villages, one in each health center catchment area. The teams went to villages where the health center had scheduled expanded outreach on the survey day to observe the vitamin A / mebendazole campaign in addition to vaccination services. Following the outreach session, as a quality control measure, both observers discussed the result. Although the observation checklist was not shared with outreach staff, it is likely that observations recorded are positively biased as staff members are likely to be more conscious of their performance in the presence of other health professionals due to the Hawthorne effect (where individuals' behaviors may be altered because they know they are being observed).

Recording and Analysis

Each team leader was responsible for joint review of the notes and tally sheets (see appendices) before submission to the ARC monitoring and evaluation officer at the end of each day. The ARC monitoring and evaluation officer tracked progress on completion of the modules to ensure sufficient inclusion of each target group.

Study data was cleaned, organized, tabulated, and processed by hand to permit completion in Khmer (Cambodian language). The intent was to reduce the time involved with translation as well as minimize the potential for loss of information. Data analysis involved classification of interviewer notes by topic and target group. More than 900 of pages of interviewer notes were entered onto spreadsheets and organized into tables to facilitate analysis. Tables were randomly checked against field notes to control for quality and accuracy. Data entry took 21 days from March 9 through April 8, 2006.

Summary tables were developed in Khmer for comparison and cross-referencing of data. These were reviewed and discussed in detail by the ARC monitoring and evaluation officer and the primary investigator for production of this report. To improve understanding of the findings as well as the readability of this report, research findings from different modules have been integrated where appropriate.

Quantitative data used to produce the graphics was taken from module 1, section 2.

VII. Findings

Best Practices

Individual in-depth interviews were conducted with health center staff, outreach team members, village leaders, and VHSG members to identify best practices and system constraints related to vaccination service provision. Overall, health center staff and village leaders provided much more detailed responses when compared to their respective colleagues (outreach teams from health centers and VSHG members in the villages). The research team suggested that this finding may be attributable to the both the higher social status and capacity of health center staff versus outreach staff; and village leaders versus VHSG members.

Best practices identified from the perspective of each key informant group highlight a variety of elements that are necessary to achieve results at each step along the vaccination service delivery chain.

When asked to identify best practices, all health center staff identified good planning, including scheduling and cooperation with local authorities (e.g., village leaders). Another important element identified as essential to achieve high vaccination coverage, according to health center staff, is a good understanding among villagers of the importance of vaccinations. "Support from people in the community is the key" stated one health center staff. "Villages that use existing communication channels to promote immunization, as well as follow up and motivate parents to bring children needing vaccinations are essential to achieve high coverage," he explained. Health center staff vaccination knowledge and the development of a positive relationship with villagers were also noted as important factors by several health center staff.

Outreach staff frequently mentioned the importance of clear record keeping in the village. Village leaders and VHSGs are responsible for maintaining these records. "Records should include the names and vaccination status of women of reproductive age and newborns. This is important so that village leaders and VHSGs can go directly to households to follow up with those registered as needing vaccinations," explained one outreach staff member. Outreach staff members also commonly noted their role in educating and promoting vaccinations as important to improve coverage. They also identified the need to have a clear schedule or plan including details such as the date, time, and location of outreach sessions as an important element to achieve high coverage rates.

Village leaders commonly noted that success depends on all stakeholders working together to help the villagers understand the importance of and "believe in" vaccination. Various village leaders commented that they take advantage of village meetings to talk about the importance of vaccinations with their fellow villagers.

All VHGS members interviewed as part of the study stated that the critical factor for high vaccination coverage is direct contact with each mother. "The best way to get people to come to outreach is to go house-to-house and physically bring people to the meeting point

when the health center outreach staff come here." However, it was also noted that this is a big responsibility and a lot of work. "There are only one or two of us in each village; going to more than 100 houses can make you tired,″ said one VSHG member.

VHSG members also mentioned the importance of promoting vaccination services in advance of the outreach team coming to the village. They frequently emphasized that they need two days advance notification that the outreach team is coming. VHSG members reported that the common practice is to be informed either the day before or the same day as the outreach session. Several VHSG members reported that the outreach team will come in the morning to say that they will return that same afternoon. VHSG members reported that this does not allow them adequate time to get people to come to outreach.

Also of related interest, caregivers reported during focus group discussions that they prefer to receive information or be reminded of outreach services either the same day or only one day before. Caregivers explained that it is difficult for them to remember if they receive information too far in advance (e.g., one day).

Key informants were asked what they consider to be their most important achievement. Responses varied for each target group. Health center staff commonly cited their primary achievement to be the completion of full coverage.[38] One health center chief stated, "We have a success rate of around 90 percent." Health center staff also considered completion of their plan to be their primary achievement. (The "immunization plan" refers to the number of planned vaccine doses administered and number of outreach sessions completed.)

Outreach staff consider their most important achievement to be their contribution to the development of the village leaders' strong belief that vaccinations are important. This conviction was corroborated when talking with village leaders as they consistently demonstrated an extremely positive perception of vaccinations. All were convinced of vaccinations' effectiveness and importance. Village leaders commonly reported that people in their village no longer suffer from different illnesses. One village leader specifically recalled that ″not so long ago, people became sick and died from measles; many people in this village were blind. Now with vaccinations and vitamin A, these are no longer problems for us."

Outreach staff also identified cooperation and participation with NGOs to improve service quality as an important achievement; they frequently mentioned their enjoyment in working with various stakeholders.

Village leaders, however, had difficulty identifying their achievements related to vaccinations. A few village leaders noted that they provided clear information to villagers relating to dates and times of outreach sessions. Although limited in number, some mentioned the control or tracking of newborns and completion of home visits to search for children needing vaccinations as achievements.

[38] Site vaccination service statistics for Angkor Chum OD (2005) show coverage to be between 80 to 87%.

VHSG had even more difficulty than village leaders in communicating their vaccine-related achievements. One VHSG member mentioned effectively communicating that vaccination is a free service. Another VHSG stated that motivating villagers to participate was an important achievement. A third VHSG cited calling meetings before outreach to make sure villagers know about planned outreach sessions.

Each key informant target group was asked, ″Many people have told me that few people in the village come for outreach; why do you think that is?" All respondents questioned the validity and source of the information that suggested low turnout. All respondents firmly disagreed with this comment.

Constraints

The major constraint to completing vaccination services identified by health center staff is the lack of staff. Also identified as issues were the following: lack of transport (specifically motorcycles), fuel, and distance as many villages are geographically dispersed throughout the health center catchment area. Irregular per diem payments, identified by the operational health district as a problematic issue, were not specifically identified by the health center or outreach staff as a barrier to completing outreach.

Obstacles and challenges identified by the outreach staff include rainy and harvest seasons, long travel distances to remote villages, and no travel budget.

Several village leaders mentioned that outreach staff do not take time to educate the community on health issues. Village leaders perceive that outreach staff only stay in the village for a short time and focus exclusively on vaccination.

Village leaders and VHSG members frequently agreed that villagers are sometimes very busy (usually related to the seasonal sowing/harvest cycle). This reduces turnout for health center outreach. Also mentioned by village leaders, but not as a major issue, is fear among villagers of side-effects (primarily post-vaccination fever).

Mentioned by VHSG members was the difficulty in disseminating vaccination information to the entire village in a timely manner.

Using focus group discussions with different target groups, villagers were asked what factors prevent "people like you" from going for vaccinations at the health center. FGDs with caregivers of children "not-on-schedule" frequently cited that newborns should not go out from the house because of fear of retribution by the spirit, which could result in sickness and death. This fear is linked to traditional Khmer post-partum practices described by FGD participants. "*Ang-pluhgn*" or អាំង ភ្លើង is the practice whereby new mothers stay in bed for seven days; charcoal is burnt under the bed. The smoke and heat from the charcoal causes sweating which is believed to remove impurities and thus makes the mother stronger following partum. Also relevant is the practice of "*chrab chewan*" or ច្រាប ជាន់ whereas one

ties a string around the circumference of the house after childbirth. This practice is believed to protect the new baby and mother from bad spirits (not people) from entering the house. This practice also lasts for seven days.

Although caregivers of children "on-schedule" frequently described this practice during focus group discussions, it was not recounted as a factor that prevented them from getting to the health center for vaccinations. By contrast, they focused on poor road conditions, access, difficulty in finding the way, the long waiting time, services not being what they want, and no money for transport.

Target groups were also asked what prevents "people like you" from coming to vaccination outreach sessions. Parents of "on-schedule" children cited being busy or unaware of the outreach visit. Also mentioned was the practice of "*ang pluehgn*" or អាង ភ្លើង and "*che-al pluehng*" or ឆ្អើភ្លើង. One person mentioned that they didn't understand the purpose of the HepB vaccination. Parents of "not-on-schedule" children were unable to provide any substantive response.

Using a convenience sample (module 3), caregivers of children not immunized and caregivers of children fully immunized were identified. They were asked to explain the reason for their child's vaccination status. Table 3 below summarizes the responses.

Table 3. Comparison of caregivers of children fully-vaccinated vs. not-vaccinated

Caregivers of fully-vaccinated	Caregivers of not-vaccinated
Vaccination is useful for my kids.	*The baby is too young.*
Take care of my child's health.	*Outreach team rarely come to provide vaccination*
Understand the advantage of vaccination because it can prevent diseases such as measles, etc.	*Waiting for the next vaccination, so require outreach team to come regularly*
Always bring my children to get vaccine when the outreach team comes	*Can't find yellow card, so I dare not bring the children to get vaccine*
Keep the yellow card until fully immunized	*Busy with farming / field work*
Always check the yellow card to get fully vaccinated	*Gave birth in the forest, very isolated and difficult to get to HC*
	In the forest while outreach team comes to provide vaccine
	Far away from HC
	Father rarely stays at home (so he cannot bring the child to outreach)
	Mother is sick

Responses from caregivers of fully vaccinated children may be grouped into two categories: (1) those people who value the attributes of vaccinations or (2) those people with a sense of responsibility either to see the outreach team or complete the yellow card. Responses from

caregivers of non-vaccinated children may also be grouped: (1) those people with false beliefs, and (2) those people citing long distance as the primary barrier.

During FGDs, female caregivers with children "on-schedule" most commonly cited benefits of immunization to be prevention against disease, measles, and paralysis. Most women in these groups were knowledgeable that seven kinds of diseases are vaccine preventable. Also mentioned as a motivating factor was concern about criticism or gossip from the outreach team if their children are not fully vaccinated.

Caregivers of children "not-on-schedule" more generally noted "*disease prevention*" and a "*reduced trend of child sickness*". However, responses from these groups were less specific when compared to mother's with children "on-schedule".

Overall, all women perceived several negative effects of vaccinations including fever, pain, swelling, difficulty breathing, and children crying for a long time following vaccination. Tetanus toxoid was reported to cause skin irritation and fever. However, these effects were not considered very serious as several mothers reported that they can use a pill/parcetamol or apply hot water for relief.

Related to tetanus toxoid, female caregivers of children "on-schedule" frequently stated that women of reproductive age should be vaccinated. There was repeated reporting that unmarried or 'virgin' women do not want to be vaccinated for "fear of the needle". They also noted that one issue is that the outreach team focuses efforts on pregnant women and children, and not on women of reproductive age.

Women not vaccinated against TT, located using the convenience sample, cited that the vaccine is not available at the health center; they never got information about that; too busy with farming or in the forest (not at home); or, were ill when the outreach team came.

Mentioned exclusively by caregivers with children "not-on-schedule" was concern about "*arrus m'die dam*" or អារីសម្តាយដើម. This term refers to the bearing of many children who die shortly after birth. Also commonly used is the word is "*skon*" or ស្កន់; a general term referring to any disease provoking "*arrus m'die dam*". Previously, neo-natal mortality was attributable to spirits, however most women now recognize that some of these diseases are preventable with a vaccine. This relates to the popular belief that new mothers should stay in the compound following childbirth for no less than seven days, but up to one month.

In relation to overall knowledge of immunizations, the survey teams perceived a correlation between remoteness and understanding of the importance of vaccinations.

Responses from male caregivers of children "on schedule" and "not on schedule" had common responses related to prevention of child and mother illness, disease prevention, and making the child healthy. All not-on-schedule interviewees were not able to mention any negative effects.

Men commonly stated that they are not involved with vaccination; they frequently suggested to the interviewer that they speak with their wife as the person more knowledgeable about the subject.

Vaccination messaging

Focus group participants were read key immunization messages (see table 4 below) and asked if they had heard this information previously and their thoughts about each message.

Table 4. Key immunization messages

1	Immunization protects your infant from certain diseases
2	Ensure that your infant completes the basic series of vaccinations by his or her first birthday
3	It is your responsibility as a parent to know when and where to take your child for his or her next immunization
4	Keep your baby's immunization card
5	To be protected against many diseases, people need to be vaccinated more than once
6	All women of childbearing age should be sure to receive enough tetanus vaccinations to protect themselves and their babies. Ask your health worker to check weather you need additional vaccination
7	It is normal for some injections to cause mild side effects such as light fever, soreness and redness. Consult with a health worker for advice about what to do if this happens

Women were familiar with these messages from radio, television, health center staff, and VHSGs. All respondents (both men and women) agreed that all messages are very important. Some respondents emphasized the importance of the yellow card. One mother reflected back, "I understand that the information of the vaccination prevents seven diseases is very important for children and infants because prevention can allow children to have good health." Another mother added, "This is accurate information, what is important is that children receive complete vaccinations; it is also important to take care of the yellow card as the yellow card can identify about the health problem."

Women also reported that they were familiar with and know how to use the yellow card. "Health center staff always ask me about the both the pink and yellow cards." Women perceive this card to be important as they are frequently asked for the card by other health organizations to see that card.

Men reported that they heard this information before from health center staff. However, they had no further comment on the messages. Women suggested additional messaging that focus on prevention of the seven diseases and "keep your child health to not lose money."

However, when asked what they consider to be the least important message, the only response was about message 7 related to side-effects. It is not considered important because "everybody knows the child will get fever, and everyone knows this is not very serious," according to one mother. However, this comment is not universal as several caregivers (particularly in Varin) stated that their child is healthy until they get vaccinated, which is when they become sick.

Focus group participants were asked, ″If you had to convince your neighbor to bring your child for vaccinations what would you tell them?" One on-schedule mother suggested that she tell her neighbors to "please bring the child to vaccination sessions to prevent the disease such as fever and difficult breathing." Another mother noted that ″when we receive the information, we continue to disseminate the information to help people to believe in vaccinations."

One father of children "on schedule" suggested to "explain the usefulness of the vaccination, if they are missing some vaccinations, they will not be effective. Please bring the child to get vaccinated against diseases and make the child have good health."

Vitamin A messaging

Focus groups participants were asked about the benefits and negative effects of vitamin A. In relation to benefits, participants identified the prevention of blindness and "clear seeing". No negative effects were mentioned.

Table 5. Key vitamin A messages

1	Your child requires vitamin A for proper growth and health
2	Vitamin A helps the body fight infections like measles and diarrhea
3	Lack of vitamin A can cause night blindness
4	Take all children over age six months and under age five years to receive vitamin A capsule
5	Vitamin A is safe, free, and effective
6	Ask your health worker about where and when to take your children for their next vitamin A capsules
7	Each child 6 months to 5 years should receive a vitamin A capsule every six months
8	Postpartum mothers should receive vitamin A capsule within two months of delivery

The question "What do you tell people about why they should come to the health center or outreach for vitamin A?" elicited responses mostly related to timing. Villagers commonly

mentioned that they are not clear about the month when the health center provides vitamin A to children. All respondents are aware that vitamin A is administered two times per year, but people had difficulty recalling which months.

The question "how they would convince their neighbor to bring their child for vitamin A?" did not elicit any responses. Several interviewees stated that they have no idea what they would say to promote vitamin A, possibly indicating that people have not yet internalized messaging related to vitamin A, as they have with immunizations.

Despite this finding, focus group participants seemed to be equally familiar with immunization and vitamin A messages when the key vitamin A messages were read out loud (see table 5). FGD participants were asked if they had ever heard this information before and what they thought about each message. All respondents reported having heard all messages from health center staff, radio, or television. Everybody believed that this information is "good" and "accurate." Some respondents do not consider message 4 to be as critical because they are ready and willing to bring children for vitamin every six months (caregivers), or whenever it is available from the health center outreach team. Women also noted that they liked the "free" aspect of vitamin A. Men did not recognize the message that vitamin A is safe, free, and effective. Women considered message 3 to be the most important, as they have seen before people with night blindness but since the introduction of vitamin A, they have seen a reduction in cases.

When asked if there are "any other messages that you believe are important to inform people about immunizations and vitamin A?" no messages were added.

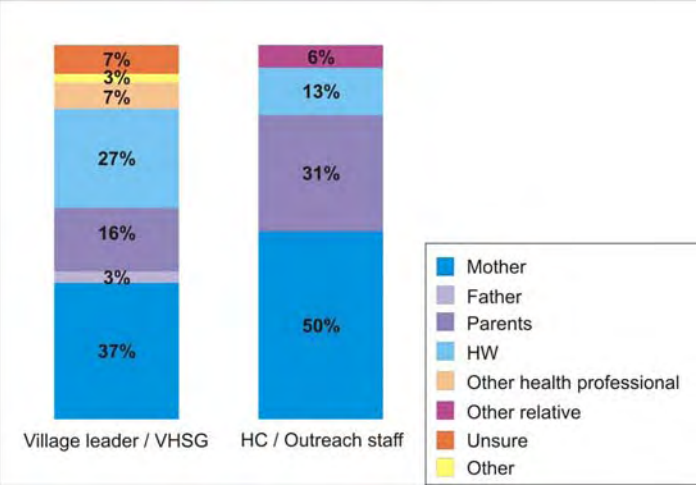
Communication channels

FGD participants were asked if there is "anything that anybody in this village could do or say to you that would want to make you take your child to get vaccinated?" Women caregivers of "on-schedule" children stated that they only needed to be informed by the village leader or volunteer.

Mothers of children "not-on-schedule" emphasized that that they needed somebody to come to their house to remind them to come. They also frequently talked about VHSG members as very important and the need for them to explain more about vaccinations and motivate people to come for outreach.

By contrast, fathers' (of children both "on-schedule" and "not-on-schedule") responses focused more on the role of health center staff. They mentioned that the health center staff are best suited to explain the effectiveness of vaccination, thereby motivating people to come for this service. Some fathers of children "on-schedule" also noted was that grandparents have influence in encouraging mothers to take their children for vaccinations. There was no mention of VHSGs among male caregivers.

Graphic 3. Who is responsible for making sure a child has their immunizations?



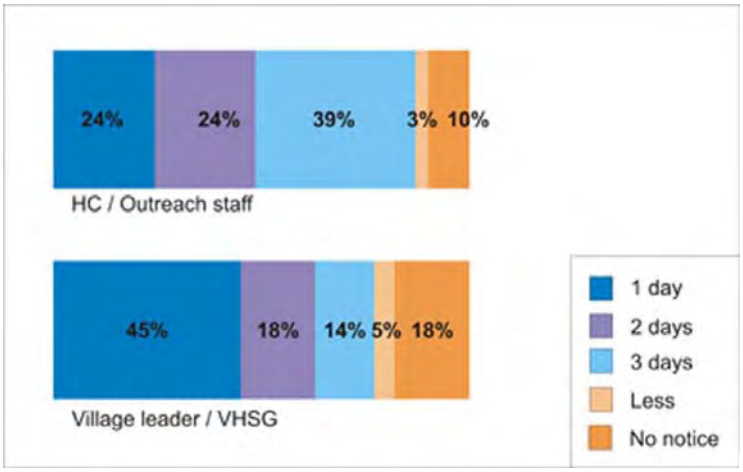
Graphic 3 illustrates different perceptions about responsibility for ensuring child immunizations. Village leaders and VHSGs place less responsibility on the parents (a cumulative total of 56 percent) compared to health center and outreach staff (a cumulative total of 81 percent). By contrast, 34 percent of villager leaders and VHSGs cited health workers or other health professionals as responsible, compared to 13 percent of health center and outreach staff who stated that health workers are responsible. Seven percent of village leaders and VHSGs were not sure who is responsible.

Scheduling outreach sessions

Health center and outreach staff members were asked to explain how they go about scheduling outreach sessions and what they take into consideration with planning outreach. Outreach staff reported that they meet with VHSG and/or village leader to set up the monthly schedule; this schedule is submitted to the HC staff who check the plan against the quarterly and annual work plan. The outreach schedule also includes other services such as HIV/AIDS, ante-natal care, etc. The final schedule is then signed by both the health center director and the outreach staff and forwarded to the OD.

Village leaders reported that they usually get a letter in addition to being informed verbally from the health center. Occasionally, village leaders receive information from the VHSG. VHSGs report getting their information directly from the health center during the monthly planning meeting which takes place at the health center.

Graphic 4. How much notice does the outreach team give before they come?



Graphic 4 clearly demonstrates different perceptions between health center/outreach staff and village leaders/VHSGs related to notification before arriving in the village for outreach sessions. Nearly 40 percent of health center/outreach staff reported giving three-days notice. Only 14 percent of village leaders/ VHSGs also reported three days.

Outreach staff members consider that they are flexible in responding to village requests and needs. Specifically mentioned was arriving in the village very early morning to catch people before they may leave to the forest and, if necessary, returning to the village when needed.

Health center and outreach staff members were asked what they do when they cannot go to the village as scheduled. They stated that canceling planned outreach is not common. Sometimes missed outreach sessions are rescheduled, but at other times they are not, and the outreach teams visit the missed villages only the following month. When an outreach session must be canceled (usually due to a meeting), they contact the village leader and VHSG at least one day before the planned session. They are contacted by phone if possible or send the message through someone. Health center staff also reported that they commonly provide a letter to the village leader and VHSG member if they must cancel. It was noted that delays in receiving letters in the village have annoyed authorities and villagers.

Disseminating the schedule in the community

Using in-depth interviews, key opinion leaders and caregivers were asked, "Where do you get your information about health center outreach and immunizations? For example, how do you know when and where to go for health center outreach activities? How do you remember the day or date that vaccination service is available?"

Within the community, information is disseminated by word of mouth as well as by promotional banners (not as common). Village leaders reported that they always share information with the VHSGs so they may proceed to inform villagers house-by-house. Village leaders reported that they tell VHSGs only once. By contrast, VHSGs reported informing outreach session information to the villagers one, two, or three times.

Monks reported getting immunization information, either from the village leader or VHSG who hang immunization promotional banners on the village leaders' houses or, in some cases, on the pagoda. There was no mention of broadcasting information over the pagoda loudspeaker system by monks. Some teachers stated that they disseminate information to school students. One teacher noted that they also inform their neighbors when casually chatting with them.

This question generated a lot of conversation among caregivers. They reported getting information primarily from the village leaders and VHSGs. Midwives and traditional birth attendants were also commonly mentioned as information sources. There was no mention of getting information from monks, teachers, neighbors, children, friends, or family. Interestingly, caregivers stated that they share information about health center outreach with their neighbors, husband, and family two to three times. One theme among caregivers was encouraging their neighbors with small children to go together to the outreach session.

All target groups reported that the information they receive is reliable, believable, and trustworthy.

Perceptions about services provided at the health center

Key informants had divergent viewpoints when asked if they thought that people would come to the health center for vaccinations if outreach stopped.

VHSG members generally believed that if outreach were to stop, the result would be mixed: some people would seek services at the health center; some would not. They believed the primary reason not to go to the health center would be the long distance to the health center as well as a lack of understanding of the importance of vaccines.

By contrast, village leaders believed that it would be very difficult or impossible for villagers to go to the health center for vaccination services. All village leaders stated that the people in their village are very poor and that it would be very difficult to convince them to go for immunization services at the health center. One village leader estimated that "for every 10 people needing vaccines, only 2 would come to the health center because the village is far away from the health center, no money for transportation and people are too poor."

Through FGDs, caregivers were asked about concerns related to service at the health center. Their input focused on long waiting times for service at the health. One mother explained, "I used to wait for half or the whole the morning before I get service." Another mother corroborated, "Some times I wait for a long time, and the few tablets they give me are the same pills I can buy at the market without waiting."

Caregivers did not complain about poor treatment from health center staff. However, generally caregivers perceive that they can get better services at a private clinic, but that the private providers' prices are prohibitively expensive.

Teachers, monks, and VHSG members consistently reported good or excellent service from the health center. This is likely attributable to staff giving them free and/or priority treatment.

When FGD participants were asked "Do you get the information you like? Tell me more about that," they generally reported that they want better understanding of and more information about health and immunization. There were isolated reports that people did not feel as if the information they received from the health center was correct.

Hepatitis B birth dose

For infants exposed by the mother at birth, monovalent HepB vaccine is 90 percent effective in preventing transmission if the first dose is administered within 24 hours and the series is completed at the recommended intervals.[39] Key informants were asked about the challenges and difficulties with giving the Hepatitis B birth dose.

Health center staff report that provision of Hepatitis B birth dose is a challenge because people give birth in the village assisted by the traditional birth attendant, and Hepatitis B is only available from the health center, which is too far away for them to travel. This is compounded by the common practice "*ang-pluhgn*" or អាំង ភ្លើង whereas post-partum women and their babies stay in the house for seven days (see below).

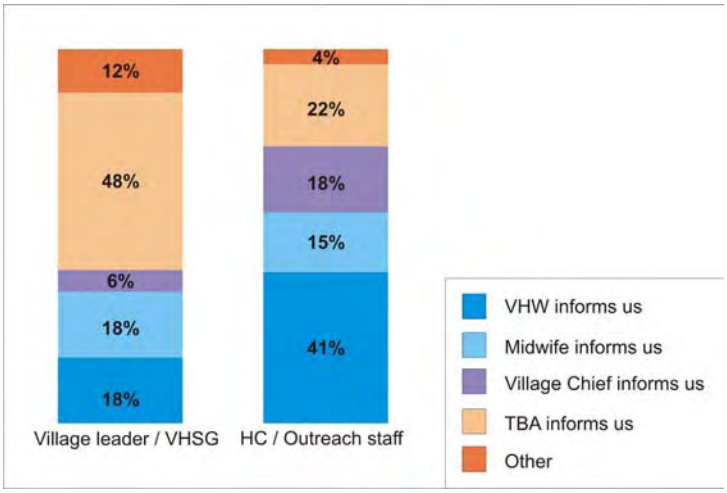
Also mentioned as an issue is that village leaders and VHSG do not immediately report new births to health center staff, who report that mothers are not clear on the usefulness of the HepB. Supply chain issues with delays in restocking were also noted.

Outreach teams reiterated the challenges identified by health center staff, emphasizing the challenge cause by the practice of "*ang-pluhgn*" or អាំង ភ្លើង. They also mentioned that mothers do not bring newborn children to outreach for fear of the child becoming sick from vaccines. Village leaders and VHSGs identified lack of transportation and the long distance to health center as barriers for post-partum women to get to the health center.

Some village leaders recognized the urgency of reporting new births immediately to the health center so as not to delay outreach staff deployment. One village leader commented, "When women deliver in my village, I report that to the health center on time because I am afraid to delay to receive the injection". Another village leader stated, "I know my community is very poor and cannot get to the health center and, if this information is reported to the health center, I "believe and trust that they can come and provide the best intervention by providing the injection at the house." Also of interest was the suggestion from village leaders that people in the village should assist with transporting post-partum women to the health center.

[39] USAID, Immunization Essentials, A Practical Field Guide, October 2003

Graphic 5. Who informs whom about newborn children?



Graphic 5 illustrates the information flow relating to newborns. Village leaders and VHSG members are informed by TBAs, midwives, and VHSGs. Health center and outreach staff report being informed by village chiefs and VHSGs about new births.

When asked their opinion about midwives or traditional birth attendants providing the Hepatitis B birth dose to women who give birth in the village, there strong opposition from health center staff and outreach teams. They stated that the vaccine cannot be provided to the traditional birth attendant as they have no experience or technical information on vaccine management. Additionally, storage in the village was identified as a concern. "If we take it [Hepatitis B vaccine] out [of the health center], it will spoil."

By contrast, village leaders stated that, based on their experience, they trust midwives because they "have never seen them make a problem for child birth," suggesting that if midwives, in particular, are trustworthy to deliver a child, they are trustworthy enough to provide a vaccine.

VHSG corroborated that midwives provide better services than traditional birth attendants. Midwives have higher knowledge and appropriate supplies (e.g. medicine).

Interpersonal Communication

Twelve outreach teams (one per health center) were observed providing vaccination services in the village. Although all observations (see table 6) are important, some desired behaviors and messages are more pragmatic in nature, and therefore may be considered higher priority. For example, actively looking for unvaccinated children is probably more likely to result in improving vaccination rates than thanking caregivers for coming for vaccination.

To account for this difference, desired behaviors of a more practical nature were grouped separately (Group A) than desired behaviors of a more educational or encouraging in nature (Group B). To reduce bias, this reorganization of observations was done during the data analysis in order to avoid any obvious grouping to the study observers. Observations classified into Group A were weighted by a factor of two in attempting to compensate for their relative higher importance when calculating a composite score for all observations.

Clearly, the goal is universal achievement of all desired behaviors and messages to provide high-quality service that is expected to result in improved demand.

Overall, Group A observations had a higher unweighted score (70 percent) when compared to Group B (53 percent). All outreach staff were observed writing the date of the vaccine on the yellow card. However, in the case of immunization series, only 31 percent of observations explained that additional vaccines were necessary to protect the child from disease. Sixty-two percent mentioned possible side effects and how to handle them.

In relation to Group B, 85 percent of observations explained in simple language the vaccine-preventable diseases. Only 46 percent used the yellow card as an instructional guide. However, 92 percent provided information regarding vitamin A.

During the expanded outreach session, outreach staff provided vitamin A capsules. The study teams observed outreach staff administering vitamin A directly into the mouths of all children. However, mebendazole was distributed by placing the tablet into the child's or mother's hand. The study teams observed three scenarios: (1) at least half of these people walked away from the outreach site without consuming the tablet, (2) approximately one-quarter of the children would taste the tablet and spit it out before consuming it in its entirety, and (3) approximately one-quarter of the children consumed the tablet.

Table 6. Observation checklist results

Group A					
Number	**Description**	**Yes**	**No**	**NA**	**% of achievement**
1	writes the date of the current vaccination being given on yellow	13	0	0	100
2	writes date of next vaccination and tells caretaker	10	2	1	83
3	associates next vaccination date with a holiday or seasonal event	6	7	0	46
4	actively looking for unvaccinated infants	12	1	0	92
5	mentions possible side effects and explains how to handle them	8	5	0	62
6	if vaccine is one in a series, explains the need for the child to complete the series to be fully protected against the disease	4	9	0	31
7	explains to come to health center for next vaccination if child misses next vaccination date	9	3	0	69
8	reminds caretaker to bring yellow card every time child is brought for vaccinations	10	3	0	77
	Unweighted Average				**70**
Group B					
9	thanks caregiver in a friendly manner for coming for vaccination	4	9	0	31
10	explains in simple language the diseases against which the vaccination protects	11	2	0	85
11	used yellow card as an instructional guide	6	7	0	46
12	if vaccination series completed, congratulates caretaker	3	8	1	25
13	congratulates caretaker if fully vaccinated	6	7	0	46
14	asks caretaker if she has any questions and politely answers all questions	6	7	0	46
15	provides information regarding vitamin A	12	1	0	92
	Unweighted Average				**53**
	Combined Average (weighted)				**64**

Yellow cards distributed by the ministry of health are designed to record immunization and growth-monitoring history. However, it was observed that growth-monitoring is not conducted during outreach and the growth-monitoring chart on the back of the yellow card is not used.

Finally, it was also observed that although the yellow card is printed on card-stock material, it is susceptible to water damage, especially during rainy season.

VIII. Key Findings and Recommendations

Key Finding 1
Interpersonal communication with each mother through home visits is a critical factor to motivate them to seek vaccination services. However, village leaders and VHSGs often do not have time to visit each house. Furthermore, caregivers, particularly caregivers of children "not on schedule", want to be reminded in their home about health center outreach one day before the session.

Recommendation 1
Volunteer and communication networks should be mobilized in the community to disseminate the outreach schedule as well as encourage caregivers to seek vaccination services for their children. Volunteers, including Red Cross volunteers, should be responsible to their communities for completing a manageable number of home visits to remind families to attend outreach one day prior to the outreach visit. It is important to motivate volunteers to develop a personal relationship with each household with whom they work. This will permit them to better understand barriers and resistances, personalize messaging, and negotiate more effectively to improve attendance for health center services.

Several village leaders and VHSG members recommended setting up small committees or village-based teams to help them get the word out and disseminate health information throughout the village. "A village committee could help us with identification and mobilization of families with children needing vaccinations," one village leader explained.

Key Finding 2
Caregivers report that they often share information about health center outreach sessions with their family and neighbors. However, they do not report receiving information from these same people.

Recommendation 2
A "neighbor-to-neighbor" campaign should be developed to encourage and formalize the practice of sharing information related to outreach scheduling.

One "not-on-schedule" father recommended that mothers with fully vaccinated children should teach and motivate their neighbors to come for immunization services.

Key Finding 3
Advance notification of the outreach schedule to the village varies and is often not adequate to permit proper dissemination of information throughout the village by VHSGs and village leaders.

Recommendation 3
Health centers should standardize the practice of informing village leaders and VHSGs at least two days before outreach. Village leaders recommended that information is provided both by letter and verbally at least two to four days before the activity.

Key Finding 4
Buddhist monks and nuns, as well as schoolteachers, are highly respected community members; however, their participation in promoting immunization services is presently limited.

Recommendation 4
Pagodas should be engaged to play pre-recorded immunization radio spots one day prior to scheduled outreach sessions using the pagoda loudspeaker system. The radio spots should be the same so that people always associate it with immunizations. Bullhorns should also be used to promote outreach sessions.

When asked for suggestions on how to improve communication about health center outreach, all caregivers suggested use of a bullhorn or loudspeaker to broadcast this information.

Teachers should also be engaged to educate school children about immunization and vitamin A. Teachers can also disseminate information about scheduled outreach sessions to students in order to pass this information along to their parents and neighbors.

Key Finding 5
Health center staff members consider their primary achievement to be the completion of "full coverage." By contrast, village leaders and VHSGs had difficulty identifying their achievements. Furthermore, immunization record keeping in the village is a critical factor as this information permits both village leaders and VHSG to go directly to those households needing follow up.

Recommendation 5
The common goal of "full coverage" should be discussed, defined, and understood among all key immunization stakeholders, especially village leaders and VHSGs. This discussion should serve as a basis for the development of a common plan to achieve "full coverage" to be monitored through the village record keeping system. Additionally, a village recognition system such as health certification or raising a flag to identify that the village has achieved its full coverage target should be developed.

Key Finding 6.1
Good planning and cooperation, as well the development of a positive relationship with villagers, village-level volunteers, and village leaders, as identified by health center staff, is critical to ensure high immunization coverage.

Key Finding 6.2
Roles and responsibilities of immunization stakeholders are not clear or well-understood, thus limiting their potential in promoting immunization services.

Recommendation 6
Relationships among key immunization stakeholders should be strengthened. This may be achieved through reactivating full participation of stakeholders in monthly health center coordination (VHSG) meetings. In addition to VHSG members, village leaders and volunteer leaders, should be encouraged to attend.

When possible, key immunization stakeholders (including health center and outreach staff, village leaders, VHSGs, volunteer leaders) should be brought together to strengthen relationships and coordination.

Roles and responsibilities among village level stakeholders including health center and outreach staff, VHSGs, village leaders, volunteer leaders and volunteers, as well as caregivers should be clarified. This should be achieved through a participatory discussion to ensure stakeholder understanding and buy-in. Health center staff should publicly recognize the role of village leaders as advocates and capitalize on their strong belief related to the effectiveness of vaccines. Village leaders should be empowered to maximize their influence in getting caregivers to seek health center services.

Additionally, the results of this study should be disseminated among stakeholders at all levels including district, health center, and village as part of a process to build on lessons learned and strengthen relationships. Finally, the findings should also be shared at the national level.

Key Finding 7
As most births occur in the village, the administration of the HepB birth dose is challenging. Furthermore, the traditional practices of "ang-pluhgn" or អាំង ភ្លើង and "chrab chewan" or ច្រាប ជាន់ deter post-partum women from going to the health center or outreach services for seven days following childbirth. A few village leaders report newborn tracking as an achievement. Health center and outreach staff are willing and interested in completing home visits immediately following birth. However, there is no uniform system for tracking and reporting newborns to the health center.

Health center staff most commonly cited the need to educate TBAs on the importance of the HepB birth dose. All health center staff identified the need to be informed immediately following childbirth. "Please report [new births] to us immediately,... it is easy for us to manage the staff to come to the village and inject the birth dose," explained one health center director.

Key immunization stakeholders agree that the HepB birth dose should be administered by health center outreach staff (midwives).

Recommendation 7
A localized birth notification plan should be developed among key immunization stakeholders. Successful approaches noted by a few village leaders should be shared among all stakeholders. The plan should detail the reporting process for new births to the health center within 12 hours of delivery as well as the protocol for a health center staff visit within the 12 hours following notification. The plan should be linked to the national birth registration system.

Key Finding 8
The benefits of tetanus toxoid (TT) are not well understood among caregivers; TT coverage rates among pregnant women are low.

Recommendation 8
A communication campaign focusing on the benefits of tetanus toxoid should be developed. Appropriate incentives, such as long-lasting mosquito nets, should be distributed through health centers to motivate pregnant women following the completion of at least two tetanus toxoid shots.

Key Finding 9
Caregivers had difficultly recalling any vitamin A messages on their own or expressing how they would convince their neighbor to bring their children for vitamin A capsules. However, when key vitamin A messages were read out loud, most caregivers were able to identify them, suggesting that people have not yet internalized messaging related to vitamin A, as they have with immunizations.

Recommendation 9
Focusing on interpersonal communication, health stakeholders should promote vitamin A key messages throughout the year. They should emphasize the benefits of consuming vitamin A rich foods that are accessible and available to caregivers in the village.

Key Finding 10
Some health centers offer priority and/or free services to VHSGs and village leaders as an incentive for collaboration. This is a highly valued and appreciated benefit.

Recommendation 10
The practice of free health services for all VHSGs, village leaders, and community volunteers who collaborate with the health center should be standardized, institutionalized, and expanded.

Key Finding 11
Outreach sessions are almost exclusively focused on immunization services. During expanded outreach, vitamin A and mebendazole are also included. The growth-monitoring chart on the back of the yellow card immunization record is not used.

Recommendation 11
Outreach sessions should be viewed as a platform upon which other services can be offered such as promotion of the Community-Integrated Management of Childhood Illnesses key family practices as well as monthly growth-monitoring. Additional services are likely to increase community awareness of and action for improved health.

Key Finding 12
Outreach staff report they do not have enough time to provide health education during outreach sessions.

Several health center and outreach staff recommended that the designation of one person to explain vaccinations during outreach sessions to improve demand for vaccination services.

Recommendation 12
Health education should be coordinated with outreach staff and provided by community stakeholders including village leaders, VHSG, nuns, volunteer leaders and volunteers.

Key Finding 13
Health center outreach staff did not directly observe oral ingestion of mebendazole distributed during expanded outreach. This task was not assigned to village leaders, VHSG member, or village-based volunteers. It is not clear how many children provided with mebendazole consumed the medication.

Recommendation 13
Protocols for mebendazole distribution should be applied; this should include the provision of clean drinking water to ensure that the tablets are swallowed. The responsibility of providing water and observing oral ingestion should be clearly assigned.

Key Finding 14
Caregivers perceive the yellow immunization card to be an important document. However, it is susceptible to water damage, especially during rainy season.

Recommendation 14
Plastic covers should be provided to reinforce the concept that the yellow card is an important document and should be protected. Plastic covers will reduce the risk of water damage.

Key Finding 15
Outreach staff interpersonal communication and focus messages during service delivery could be improved. Specifically, there is a need to reinforce communication related to completing vaccines given as part of a series as well as associating vaccination dates with other days of significance such as holidays.

Recommendation 15
Practical training should be provided to health center staff to refresh interpersonal communication skills using adult-learning methodologies.

Finding 16
The primary barrier for villagers to go to the health center for services is distance and related travel costs. The national level fixed-site strategy pilot has demonstrated favorable results.

Recommendation 16
Fixed-site vaccination services should be scaled up over time to all villages near health centers. Communities should have maximum feasible participation to ensure vaccination service seeking at the health center. Scale-up should be closely monitored in order to detect and resolve any challenges to service delivery through the fixed-sites.

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A formative research study

FY-2004 Child Survival and Health Grants Program (CSHGP)
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CAMBODIAN RED CROSS

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Note: The research protocol for this study was submitted to the National Ethics Committee for Health Research, Ministry of Health, Kingdom of Cambodia

ACRONYMS AND ABBREVIATIONS

AD	Administrative District
A+M	Artesunate and Mefloquine
BTC	Belgian Technical Cooperation
CMBS	Cambodia Malaria Baseline Survey
CNM	National Malaria Center
CSHGP	Child Survival and Health Grants Program
CRC	Cambodian Red Cross
CVCG	Community Volunteer Care Group
FGD	Focus Group Discussion
HC	Health Center
HMIS	Health Management Information System
ICH	Integrated Child Health
IDI	In-depth interview
IEC	Information, Education, and Communication
IM	intramuscularly
IV	intravenously
ITN	Insecticide Treated (Bed) Net
KPC	Knowledge, Practices, and Coverage
LLIN	Long lasting insecticide treated mosquito net
M&E	Monitoring & Evaluation
MOH	Ministry of Health
MVU	Mobile Video Unit
OD	Operational District
p.	plasmodium
PHD	Provincial Health Department
PSI	Population Services International
RACHA	Reproductive and Child Health Alliance (local NGO)
RTK	Re-treatment Kit
USAID	United States Agency for International Development
VHSG	Village Health Support Group
VMW	Village Malaria Worker

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EXECUTIVE SUMMARY

Background

Cambodia has the worst malaria mortality and morbidity rates in Southeast Asia and one of the highest rates of malaria drug resistance in the world.[1] According to the National Health Statistics Report (NHSR) 2003, malaria is the third most common cause of outpatient attendance, the fifth main health problem among inpatients, and the second most common cause of hospital mortality.

Factors such as poor health infrastructure, drug resistance, and delayed care-seeking contribute to the ongoing threat of malaria in Cambodia. Health center understaffing as well as chronic drug stock-outs limit effective treatment delivery. Private vendors who provide drugs, especially in remote and difficult to access areas are by and large unregulated and untrained. Such vendors may be increasing the potential for further drug resistance as they frequently provide ineffective and/or partial drug courses. Delayed care-seeking at the health center and under utilization of insecticide treatment and mosquito nets are also issues which need further attention.

The American Red Cross (ARC), in partnership with the Cambodian Red Cross (CRC), is implementing an Integrated Child Health (ICH) Project funded by United States Agency for International Development (USAID). The goal of the ICH Project is to reduce child morbidity and mortality in a sustainable fashion in Angkor Chum Operational District of Siem Reap Province, Cambodia. To support the project's goal, a research study was carried out by ARC in partnership with CRC, the National Malaria Center, the Siem Reap Provincial Health Department, and the Angkor Chum Operational District with support from the Belgian Technical Cooperation (BTC), Reproductive and Child Health Alliance (RACHA), and Population Services International (PSI).

Study goal and design

The study's primary goal is to align stakeholders in the development and implementation of a comprehensive, evidence-based strategy to overcome the challenges to effective malaria prevention and treatment in Angkor Chum Operational District. Three research modules focusing on (1) malaria prevention, (2) early identification and referral, and (3) treatment were designed and developed for this study. Secondary quantitative analysis of relevant data from the population-based KPC survey undertaken in March 2005 was also completed to corroborate several qualitative findings.

Findings

Data from the March 2005 KPC survey revealed striking differences between the administrative districts of Angkor Chum and Varin concerning transmission knowledge among caretakers. While 86 percent of caretakers from Angkor Chum district identified "mosquito bites" as the cause of malaria, only 64.9 percent of Varin district caretakers cited that same response. Participants of the focus group discussions (both genders), also

[1] http://www.cambodia.net/malaria/facts.html, retrieved January 17, 2006

demonstrated a good understanding of malaria transmission, most frequently citing "mosquito bites" as the primary cause of malaria.

False beliefs related to malaria transmission, although limited, do exist. False beliefs include ingestion of bad/dirty/unboiled water, cutting grass around the home, and avoidance of contact with people who have malaria.

According to KPC survey data, 67.9 percent of households in Angkor Chum have a mosquito net compared to 58.4 percent of households in Varin. Responses given during the focus group discussions suggest that most people view mosquito nets as important and beneficial. The chief motivating factor for mosquito net use was the prevention of mosquito bites; the single de-motivating factor reported was the unpleasant smell of a new net. Focus group participants commonly expressed concern that: (1) they did not have an understanding of insecticide treatment, (2) they did not have sufficient mosquito nets to protect the entire family, and (3) mosquito nets tear or rip easily.

Statistical analysis failed to detect a correlation between households reporting fever with a mosquito net in the home. It would be expected that households with a mosquito would have less fever; this was not the case. As this data was collected in March (non-transmission season), it is plausible that at least some fever recorded was not malaria. Other plausible explanations for the seeming ineffectiveness of mosquito net use in reducing fever prevalence include: (1) removal of children from under the mosquito net after dusk, (2) lack of insecticide use, and (3) holes or tears in the net.

Female focus group participants became excited and wanted to learn more about insecticide treatment when facilitators introduced the topic. The women overwhelmingly responded that they would bring their net for insecticide treatment to health center outreach if it were offered as a *free* service. One reoccurring theme among focus group participants who had experience with insecticide treatment was the idea that the more recent insecticide treatment was not effective as it did not kill lice as it did following treatment done (by the health center) in 2003.

Focus groups (both genders) reported giving priority use of the mosquito net to small children. The primary reason for this is that people recognize that young children are more vulnerable to malaria. However, there was no mention in any group about increased malaria risk or priority net use for pregnant women.

The practice of removing small children from under the mosquito net after dusk, to avoid leaving the child alone while they visit with family and neighbors, seems be common.

Among focus group discussions with people who currently do not use a mosquito net, there was a strong interest to have one, but reported that cost was the barrier.

In the KPC survey, among caregivers reporting their youngest child having fever in the previous two-week period, 46 percent cited that they sought advice or treatment outside

the home. If the child's symptoms persist or get worse, the mother will most frequently consult a shopkeeper and purchase drugs following their recommendation. If the child's symptoms persist or get worse following self-treatment (after two days), they will then take their child to the health center or hospital.

Focus group discussions revealed that following recognition of malaria signs and symptoms, a mother typically employs traditional medicines to make a tea. The tea is most commonly used externally (e.g. not ingested) to reduce body temperature. This homecare is used for the first one to two days of symptom onset.

If the child's symptoms persist or get worse, the mother will most frequently consult with a shopkeeper and purchase drugs following their recommendation. If the child's symptoms persist or get worse following self-treatment (after two days), they will then take their child to the health center or hospital.

Malarine is not widely available and the price is increased by up to six times the recommended selling price. Most focus group participants are able to identify the product stated they had seen it on television advertisements. Other drugs bought from village shopkeepers for malaria symptoms are mostly non-effective. Care-seeking with shopkeepers was reported to delay recommended treatment by two days.

Action Plan

A one-day stakeholder workshop was convened on November 25, 2005 to share the study findings and develop a joint strategy. The ARC, National Malaria Center, Provincial Health Department, Operational District, BTC, PSI, RACHA and CRC all participated. Stakeholders developed a joint action plan that identified activities needed to strengthen health education, insecticide treatment, mosquito nets, as well as drug availability and access.

Definitions

Clinical malaria is defined as the presentation of malaria symptomology without a positive blood test.

Confirmed malaria is defined as those cases that have a positive diagnostic test. In Cambodia, the Ministry of Health (MOH) aims for all malaria cases to be confirmed.

The terms **cause** and **transmission** are used interchangeably in this report. Although, technically, malaria is caused by the *p. facilparum, p.vivax, p. malariae,* and *p.ovalae* parasites transmitted by mosquitoes, villagers have a more pragmatic understanding of malaria causation that is based on the transmission pathway (e.g. mosquito bites).

Barriers refer to external factors that prevent or hinder a behavior.

Resistances refer to individual, group, or cultural beliefs, ideas, or thoughts that prevent or hinder a behavior.

Introduction

Malaria is a significant public health issue. In Cambodia, the presence of *plasmodium (p.) falciparum*, *p. vivax, p. malariae* and *p. ovalae* is complicated by one of the highest rates of drug resistance in the world[2]. *P. falciparum*, the most potentially deadly type of malaria, accounts for an estimated 60-90 percent of rural cases.[3] With a malaria incidence (treated cases) of 7.5 per 1000 and 382 deaths in 2004, malaria poses a considerable disease burden, especially in high transmission areas.[4] New settlers in high transmission areas, people living or working in proximity to medium and high forest-covered zones, people who are immune compromised, pregnant women, and children under five are at greatest risk of infection. One study documented malaria parasite rates in children to be 47 times higher in villages surrounded by forest than by rice fields.[5] Non-use of mosquito nets and under utilization of insecticide treatment further increases malaria risk among the vulnerable.[6]

In November and December 2004, the four (Second Round) Global Fund sub-recipients in Cambodia (CNM, Health Unlimited, Partners for Development and Populations Services International) commissioned the United Kingdom based Malaria Consortium to provide technical assistance in carrying out the Cambodia National Malaria Baseline Survey (CMBS) with the Cambodian National Institute of Public Health. The CMBS collected quantitative information at the national level to serve as a malaria situational

[2] http://www.cambodia.net/malaria/facts.html, retrieved January 17, 2006
[3] Population Services International, Annual Report 2004 p.12
[4] USAID, Malaria Strategic Plan 2006-2011, p.10
[5] Royal Government of Cambodia Ministry of Health, Country Update on Malaria Control, 2001
[6] Royal Government of Cambodia Ministry of Health, National Centre for Parasitology, Entomology and Malaria Control, November 2004 p.5

analysis, record core indicator baseline figures, and improve malaria control interventions, policies, strategies, and programmatic priorities.

According to the *Cambodia National Malaria Baseline Survey (CMBS) 2004,* 23.8 percent of children under 5 years of age were reported to have fever in the past two weeks. The Integrated Child Health (ICH) Project Knowledge, Practices and Coverage Survey (March, 2005), suggests that the malaria situation is even more severe in Angkor Chum OD. Two-week fever prevalence for children under two years of age was documented at 38 percent.[7]

Prevention, as well as timely and correct treatment, will reduce the malaria burden and avoid unnecessary deaths.

Presently, untreated mosquito nets are available through the private sector. The price ranges from about $2.50 to $4.00 depending on the distributor and size of the net. Insecticide used for treatment of mosquito nets is available in limited amounts through the National Malaria Center.

Recognition of danger signs is a precursor to seeking prompt care and treatment that can greatly improve chances for child survival. Children with uncomplicated malaria must be given prompt treatment (recommended within 24 hours of fever onset) with an effective anti-malarial drug to avoid subsequent progression to severe malaria.[8]

The *Community drug use practices in malaria in Cambodia study* revealed that treatment efficacy is highest among public health facilities and lowest among village providers. By increasing drug availability in the village, private village providers have seemingly filled a service gap, especially in remote and difficult to access areas. Unfortunately, these vendors are by and large untrained and unregulated.

Additionally, there is growing evidence that village drug sellers may be contributing to the potential for further drug resistance as they frequently provide ineffective and/or partial drug courses. *The Community drug use practices in malaria in Cambodia study* revealed that amongst people with suspected malaria within the previous two weeks, 74 percent received anti-malarials. However, only nine percent received a recommended first line treatment of A+M (6 percent) or *malarine* (3 percent).

According to the *Report of the Cambodia National Malaria Baseline Survey 2004*, of respondents or other household members with fever in the last two weeks reporting taking drugs, only 7.3 percent reported taking a known anti-malarial drug.

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[7] The differences in these prevalence rates may also be attributed to: (1) the age difference among those included in the sample (younger children are likely to be more vulnerable than older children) and/or (2) seasonal variations.

[8] Crawley, J. Reducing deaths from malaria among children: the pivotal role of prompt, effective treatment in Technical Reference Materials: Malaria, PVO Child Survival and Health Grants Program, revised 2004

Furthermore, as most malaria treatments provided through village shop keepers are ineffective, their purchase and use consumes scarce resources and delays effective treatment care-seeking: needlessly increasing the risk for death.

In Cambodia, the recommended treatment for uncomplicated malaria for children aged 6 months to 5 years is artesunate suppositories for 5 days followed by mefloquine. For this age group, *the Community drug use practices in malaria in Cambodia study* documented that only 3.4 percent received artesunate and mefloquine with a further 2 percent receiving A+M. Only one child received an artesunate suppository, one additional child received an artemisinin suppository. Neither case received mefloquine. Only 48 percent of children in this age group with suspected malaria received any artimisinin.

The National Malaria Center (CNM) has taken steps to increase drug access and availability in the most remote villages through its Village Malaria Worker (VMW) program. VMWs are trained in malaria prevention, identification (including testing), and treatment; they are also provided with malaria drugs (A+M). At the time of this study, the CNM had in place 17 VMWs, all based in Varin administrative district.

Study Partners

The American Red Cross (ARC), in partnership with the Cambodian Red Cross (CRC), is implementing an Integrated Child Health (ICH) Project in Angkor Chum Operational District, Siem Reap Province. The ICH Project, funded by USAID, is working alongside the Ministry of Health (MOH) and numerous non-governmental organizations to reduce infant and child morbidity and mortality. The ICH Project focuses on the child survival "scorecard" interventions identified as priorities during the December, 2004 National Child Survival Partnership Workshop in Phnom Penh, Cambodia. These interventions have been demonstrated to have the greatest impact on child mortality and include use of insecticide-treated mosquito nets as well as improved access to appropriate anti-malarials through early identification and referral.[9]

In Angkor Chum Operational District, numerous stakeholders are working towards improving effective malaria prevention and control. Population Services International (PSI) is socially marketing *malacheck*, a rapid diagnostic test kit to confirm *p. falciparum* malaria, to trained, private pharmacists. PSI is also socially marketing *malarine*, a highly effective three-day treatment combining artesunate and mefloquine, the current regimen recommended for *p. falciparum* malaria by the World Health Organization and the CNM. Three-day treatments are pre-packaged for adults and children over five years of age. Additionally, as part of the Second Round Global Fund activities, PSI is preparing to market a long-lasting insecticide treated mosquito net (LLIN), and a stand-alone re-treatment kit (RTK) for traditional nets kits around June 2006. Both products will be sold at a subsidized price.

The local non-governmental organization Reproductive and Child Health Alliance (RACHA) is working with shopkeepers across Angkor Chum OD to simultaneously reduce distribution of counterfeit anti-malarial drugs while increasing access to *malarine*. RACHA is also training shopkeepers in early identification of malaria symptoms to improve early referral to the health center.

The Belgian Technical Cooperation (BTC), through its Provision of Basic Health Services project, is supporting the improvement of health service delivery focusing on extending hours of operation at the health center.

With the support of the CNM, the Siem Reap Provincial Health Department (PHD) and Angkor Chum Operational District (OD) have successfully distributed approximately 2,000 mosquito nets to villagers in priority zones 1 (in the forest) and 2 (less than 200 meters from the forest). Additionally, they have treated over 600 mosquito nets with insecticide and put in place 17 village malaria workers (VMWs) to facilitate malaria education and access to anti-malarials in the most remote villages. Unfortunately, monthly stock-outs of dipsticks (testing kits) and anti-malarial drugs at the health centers continue to be a barrier to effective treatment provision.

[9] Jone G, Steketee R, Black R, Bhutta ZA, Morris SS., How many child deaths can we prevent this year? *The Lancet* Vol 362, July 5, 2003

The qualitative piece of this study was undertaken in partnership with the above stakeholders (PSI, RACHA, BTC, CNM, PHD, and OD) to better understand limiting factors to effective malaria prevention and treatment.

Goal and Objectives

The goal of the study is to align stakeholders in the development and implementation of a comprehensive, evidence-based strategy to overcome the challenges to effective malaria prevention and treatment in Angkor Chum Operational District focusing on the two Administrative Districts of Varin and Angkor Chum. The secondary goal is to forward the understanding and strategic development of malaria prevention and control activities in Cambodia. Specific objectives related to malaria prevention, early identification, referral and treatment are detailed below.

Prevention

1. Identify and document motivating factors as well as resistances and barriers to year-round mosquito net use.
2. Understand mosquito net practices among villagers including priority usage within the family/household, attitudes related to insecticide treatment including KO tabs, and removing infants and small children from under the net to carry them on their backs during the night.
3. Understand attitudes relating to insecticide re-treatment campaigns through expanded health center outreach.

Early Identification

4. Understand caretaker perceptions of fever, high fever and convulsions as malaria danger signs.
5. Identify and develop messaging that alerts caretakers to the malaria danger signs.
6. Identify and document perceptions of *malacheck* as well as barriers and resistances to its use.

Referral and treatment

7. Understand preferred malaria treatments and the reasons for preference among caregivers.
8. Understand caretaker motivating factors as well as resistances and barriers in prompt care seeking at the health center following identification of malaria danger signs.
9. Understand caretaker perceptions of *malarine* as well as barriers and resistances to its purchase and use.
10. Understand the role of opinion leaders and shopkeepers in promoting and distributing ineffective/sub-optimal malaria treatments.
11. Understand shopkeeper perceptions of *malarine* as well as barriers and resistances to stocking it.

Methodology

The methodology section describes the study modules, sampling and recruitment, team training, and logistics, in addition to recording and analysis.

The research protocol consisted of three modules focusing on malaria prevention, early identification, and referral and treatment. To complement qualitative data, quantitative data related to malaria knowledge, mosquito net use, and treatment seeking patterns, collected in March, 2005 as part of the baseline cross-sectional KPC survey was re-analyzed.

Table 1. Research modules, planned target groups and methodology

Module	Planned Target Groups (and number FGDs/IDIs)		Planned Methodology
1-Prevention	1. Female caregivers aged 19-49 of children <5	a. self-reporting year-round mosquito net use (8) b. self-reporting seasonal mosquito net use (1) c. self-reporting no mosquito net use (4)	Focus Group Discussions
	2. Married men aged 19-49 with children <5	a. self-reporting year-round mosquito net use (7) b. self-reporting seasonal mosquito net use only (4) c. self-reporting no mosquito net use (1)	
2-Early Identification and Referral	1. Female caregivers aged 19-49 of children <5 (9)		Focus Group Discussions, In-depth interviews
	2. Married men aged 19-49 with children <5 (10)		
3-Treatment	1. Commune/village leaders (3/3)		In-depth interviews
	2. Village Malaria Workers (3)		
	3. Shopkeepers (3)		
	4. Midwives (4)		
4-Knowledge, Practice, and Coverage (KPC)	1. Caregivers with child under 2 years of age 2. Caregivers reporting child under 2 years of age with fever in the previous 2 weeks		Secondary quantitative analysis of relevant baseline survey data

Sample and Recruitment

The Angkor Chum and Varin administrative district governors selected 19 malaria-affected villages for participation in the study. A visit schedule was jointly developed. The selected villages were geographically distributed over each district. Prior to field work, the district governors informed commune and village leaders about the study and asked them to organize target group participation on a voluntary basis following the agreed upon schedule. Village leaders attempted to pre-select participants to meet the criteria of the target groups as requested by the district governors.

Focus group discussions were segmented by gender. This was done to address concern about the potential for limited participation and free expression of female participants in mixed gender groups. In practice, segmentation by gender proved challenging as men often gravitated to participate in women only groups. The study team resolved this issue by creating a 'faux' group discussion when necessary. That is, upon arriving in the village, pre-selected participants were screened again by the study team. Only those fulfilling the selection criteria were brought out of earshot from the waiting point to conduct the focus group discussion. The remaining villagers were engaged in a general discussion about malaria prevention and control. The later or 'faux' group discussion however was not recorded or analyzed.

For the prevention module, focus groups were also segmented by self-report of mosquito net use. The plan was to conduct three focus groups with each of the six target groups. However, individuals reporting seasonal mosquito net use and non- net use were scarce. In one village, the primary investigator went to every house in that village to locate non-users; none were found. This was repeated in another village where the only houses that were reported not to have a mosquito net, were those where nobody was home (and those were very infrequent). Field teams were only able to complete one FGD with men reporting seasonal use. In the villages, many men were reported to be either working in rice fields or in the jungle cutting wood. A total of 26 focus group discussions were completed for module 1. Table 1 above shows the number of groups by target group.

In relation to the early identification and referral module, the plan was to conduct four male and four female focus groups. A total of nine male and ten female groups were completed as the planned number of groups proved to be inadequate in exhausting new information. Additionally, sixteen in-depth interviews were conducted using this same module: commune leaders (3), village chiefs (3), Village Malaria Workers (3), shopkeepers (3), and midwives (4). These same 16 key informants were also interviewed using module three which focused on treatment.

The fourth module, knowledge, practice, and coverage (KPC), was derived from a secondary analysis of relevant data from the population-based survey carried out in Pourk, Angkor Chum, and Varin districts in March, 2005. This survey used a randomized, two-stage cluster methodology to achieve a representative sample for the three districts. The survey tool included a series of questions (see Annex 4) to investigate

care-seeking practices for caregivers of children under two years reporting their youngest child to have had fever within the last two weeks. Relevant data from Angkor Chum and Varin districts was re-analyzed to enhance and corroborate findings from the qualitative modules of this study. Behavioral recall has been demonstrated to increase validity when linked to an actual event (e.g. care-seeking for a recent illness episode). Therefore, the data is considered to be relatively valid and accurate. Finally, quantitative data from the KPC survey relating to malaria transmission knowledge and mosquito net use has also been incorporated into this report to provide a more comprehensive understanding of the actual situation in Angkor Chum and Varin.

Training

The study team conducted a one-day training on September 19, 2005. The training included a review of qualitative study skills including facilitation of focus group discussions and note-taking. The training also encompassed a detailed discussion of the study objectives and discussion guides. The training ended with logistics planning.

Logistics

The study team focused on completion of focus group discussions for modules 1 and 2 from September 20-24, 2005. During that week, the study team was organized into two teams, each of which consisted of two, two-person interview sub-teams. Each two-person sub-team rotated facilitator and note-taker responsibilities.

Module 3 in-depth interviews were completed from September 27 -30, 2005.

Recording and Analysis

Each sub-team was responsible for joint review of the notes before submission to the ARC monitoring and evaluation officer each day. All focus groups and in-depth interviews were also recorded using digital MP3 recorders. Recordings were downloaded each night onto a computer to facilitate detailed review of sessions as needed during analysis.

Data analysis was done by hand in order to permit this to be completed in Khmer (Cambodian language). The intent was to reduce the time involved with translation as well as minimize the potential for loss of information. Data analysis involved classification of interviewer notes by topic and target group. Recordings were repeatedly checked to supplement interview notes for clarity or additional detail when needed. Summary tables were developed in Khmer for comparison and cross-referencing of data. Summary matrixes and findings were translated into English. These were reviewed and discussed in detail with the primary investigator for production of this report.

Findings

Prevention knowledge and understanding of transmission

Quantitative KPC survey data shows significant differences in caretaker knowledge about malaria transmission between Angkor Chum and Varin. Eighty-six (86) percent of Angkor Chum caretakers cited "mosquito bites" as the cause of malaria compared to 64.9 percent of Varin caretakers. Residents of more rural Varin district were more likely to identify incorrect transmission routes such as witchcraft, intravenous drug use, blood transfusion, injection, and sharing razor blades (cumulative total of 18.2 percent). "Other" responses included: acclimation to new place (lack of environmental immunity), travel to and return from the forest or mountain, ingestion of bad/dirty/un-boiled water, no bed net, small ponds (breeding sites), and sleeping in the rice field. The association of malaria with bad/dirty/un-boiled water, while technically not accurate, is a constructive health belief for diarrhea prevention.

Table 2. Reported cause of malaria by administrative district

Cause	Angkor Chum			Varin			Chi2 for difference in %
	n	N	%	n	N	%	
Mosquito bites	72	84	**85.7**	50	77	**64.9**	0.0021
Witchcraft	0	84	**0.0**	2	77	**2.6**	0.1372
Intravenous drug use	0	84	**0.0**	2	77	**2.6**	0.1372
Blood tranfusion	0	84	**0.0**	4	77	**5.2**	0.0056
Injection	0	84	**0.0**	1	77	**1.3**	0.2948
Sharing razor blades	1	84	**1.2**	5	77	**6.5**	0.0760
Other	3	84	**3.6**	10	77	**13.0**	0.0240

Corroborating quantitative data shown above, both women's and men's focus groups demonstrated a basic understanding about malaria transmission. Both groups most commonly identified mosquito bites as the cause of malaria. Most other causes identified by both groups were attributable to un-boiled/dirty drinking water, no hygiene, non-use of mosquito nets, and lack of insecticide. Of interest is the fact that these causes were expressed from the perspective of non-action on the part of the individual or family, thus suggesting there is potential to take action, and therefore control over transmission.

The only notable difference between the men and women's groups was that women were more descriptive and detailed when discussing the causes of malaria.

Table 3. Causes of malaria reported during focus group discussions

Women's FGDs	Men's FGDs
-Mosquito bite *-Drinking dirty/un-boiled water* *- Sleep without mosquito net* *- No hygiene* *-No insecticide* *-Cha Baum bite** *- Travel/overnight in stay at the mountain or in the forest (looking for food or wood)* *- Dirty water in small pond surround the house (breading sites)* *-Lack of vitamins (general)*	*-Mosquito bite* *-Drinking dirty/un-boiled drinking water (including mountain water)* *- No hygiene* *- Sleep without mosquito net* *-No Insecticide* *- Lack of clothing to protect skin* *-Drinking water contaminated by limestone* *-Children taking a dirty shower* *-"Affected land" meaning malaria endemic area* *-Not enough food*

*Cha Baum is a large flying insect

Although not as common, there is some understanding of the connection between illness and nutrition. Women associated lack of vitamins with malaria; men mentioned not enough food. That is, women were more concerned about the nutritional quality of the food, in contrast to men who were concerned with quantity and feeling full after eating. One older woman commented, *"Everyday we only eat salt and chilly water with rice and prauhauk (salt flavored with fish), we do not have enough money to buy pork, fish, and vegetables. If we eat like that how can we have enough vitamins? If I had enough money, I would buy meat and vegetables to give my family good vitamins".*

When asked what people do to prevent malaria, focus group participants commonly cited burning wood, palm leaf, cow and buffalo dung to repel mosquitoes, use of mosquito nets, cutting grass around the house, as well as avoiding contact with people that have malaria.

Mosquito nets

Data from the KPC survey showed that 63.4 percent of households in Angkor Chum and Varin had a mosquito net in the home (validated by the interviewer). Boys were more likely (68.3 percent) than girls (58.2 percent) to live in a home with a mosquito net. Stratification by mother's age revealed that young mothers (under 25 years of age) are more likely to have a mosquito net (nearly four out of every five), compared to older mothers (25 years of age and older), of which only 54.9 percent have a net.

Stratification by administrative district also showed that surveyed households in Angkor Chum (67.9) are more likely to have a mosquito net then households in Varin (58.4).

Table 4. Mosquito net in home by child gender, mother's age and administrative district

Background Charateristic	n	N	%	CI
Mosquito net in home	102	161	**63.4**	52.8 - 73.9%
Child's gender				
Female	46	79	**58.2**	42.8 - 73.6%
Male	56	82	**68.3**	54.0 - 82.5%
Mother's Age				
<25 years	46	59	**78.0**	63.0 - 92.9%
25 years and over	56	102	**54.9**	41.2 - 68.6%
Administrative District				
Angkor Chum	57	84	**67.9**	53.7 - 82.0%
Varin	45	77	**58.4**	42.9 - 74.0%

Logistic regression analysis failed to detect a correlation between households reporting fever (as the outcome variable) with correct transmission knowledge or presence of a mosquito net in the home. It would be expected that households with a mosquito would have less fever; this was not the case. As this data was collected in March (non-transmission season), it is plausible that at least some fever recorded was not malaria. Other plausible explanations for the seeming ineffectiveness of mosquito net use in reducing fever prevalence include: (1) removal of children from under the mosquito net after dusk, (2) lack of insecticide use, and (3) holes or tears in the net.

Focus groups and in-depth interviews provide insight into motivating and de-motivating factors related to mosquito net use. Information summarized below is for all target groups as inter-group comparisons revealed no notable differences.

Table 5. Motivating and de-motivating factors for use of mosquito net

Motivating	De-motivating
- *To prevent mosquito bite* - *Disease prevention* - *Malaria prevention* - *Easy/improved sleeping* - *Protect child health* - *Reduced medical costs* - *Avoidance of fever*	- *Unpleasant smell*

Focus group participants were easily able to identify many benefits of using mosquito nets. Consistently, people expressed that mosquito nets are important and useful.

New nets were reported to have a slight, unpleasant smell. People noted that this is not a major concern, and would not prevent them from using a net. One woman stated, *"My child had difficulty sleeping under the mosquito the first night because they were not used to it and because of the smell, after the first night my child sleeps well."*

Focus group participants commonly complained that they did not have an understanding of insecticide treatment, only having one net in the home, and that mosquito nets often tear or rip easily. On man stated, *"I have seven children and only one mosquito net, which the health center gave me in 2003. Now it is broken and has holes."*

Women mosquito net users were more likely to be familiar with insecticide treatment. They reported that health center staff had provided insecticide treatment in the community within the last six months and previously in 2003. Several people stated that the more recent treatment was not effective as it did not kill lice as it did following the 2003 treatment. Men reported having heard about insecticide treatment, but not having experience using it. Mosquito net non-users had never heard about insecticide treatment.

Focus group participants consistently cited their desire to have more mosquito nets in the home; they described one net as being too small or narrow to accommodate all family members. One mother stated, "*Because I have four children and only one mosquito net, all my children must sleep under that net, because it is too narrow they are not able to sleep well; too many people are sleeping together and they are not getting enough air*."

With limited net availability, priority use becomes an issue. Among doer focus groups (those reporting to use mosquito nets), both women's and men's groups consistently reported giving priority use to small children. The primary reason for this is that people recognize that young children are more vulnerable to malaria. One father explained, *"My youngest children are more easily affected by disease and need protection. I am afraid the baby will get sick"*.

Women commonly sleep with their children if there is space under the mosquito net. However, there was no mention in any group about increased malaria risk or priority net use for pregnant women.

Other research[10] has suggested that small children are frequently removed from under the mosquito net after dusk. This practice seems to be common as approximately half of all focus groups confirmed this to be true. This practice is linked to a cultural taboo against leaving small sleeping children unattended; and is related to the belief that spirits may wake the baby, causing it to cry which may result in the child becoming sick. Sleeping

[10]cited in Ministry of Health, Kingdom of Cambodia, *Annual progress report*, National Center for Parasitology, Entomology and Malaria Control, 2004

children are often left to be cared for by other family members while the mother spends time visiting with family, neighbors and/or watching television. When other household members are not available to watch the sleeping child, the mother will take the child with her.

Non-doers, or those people who currently do not use a mosquito net, expressed strong interest to have a mosquito net, but reported that cost was the barrier. One mother reported, "*the Indian seller charges 15,000 Riel for one mosquito net, this is too high, so people are not able to buy it".* Cost was also cited as a barrier to taking a mosquito net when traveling to the forest or rice field. Not surprisingly, non-users were unable to describe the advantages of mosquito net use as easily as users.

Focus group members' concerns about lack of insecticide treatment information is consistent with findings from the KPC: only seven households reported to have soaked or dipped their mosquito net in a liquid that repels mosquitoes or insects. None reported to have had done so within the past 12 months.

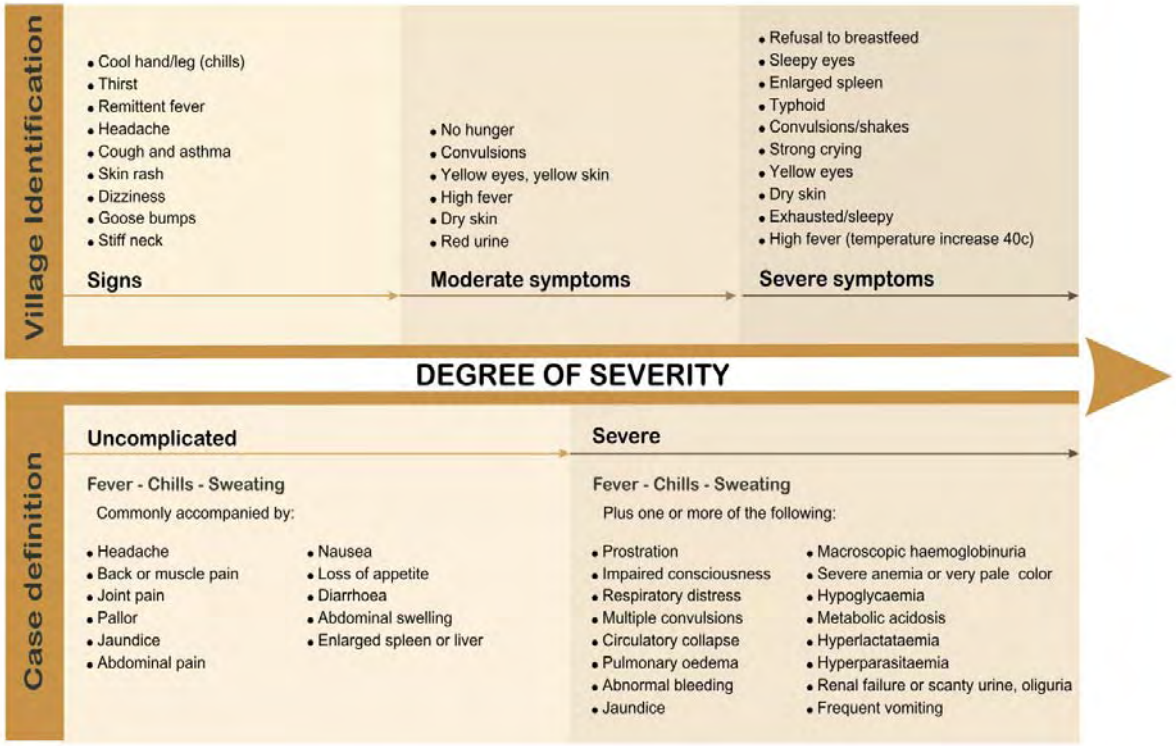
Female interviewees were interested to learn more about insecticide treatment. They overwhelmingly responded that they would bring their net to health center outreach if this were offered as a *free* service. One woman explained, *"if the health center gives insecticide, I will bring my net for treatment because I want to protect my family against mosquito bites so they are not effected by mosquito diseases."* Although men did not disapprove of insecticide treatment, they were less interested. One man explained, *"I know that health center staff come to explain about insecticide treatment, but I have not been involved with that."*

Another important aspect of insecticide treatment of mosquito nets is the washing interval. Data from the KPC survey showed that frequency of mosquito net washing as follows: 30.2 percent once a week, 51.2 percent once a month and 18.5 percent less than once a year.

Early identification and referral

Focus group participants and interviewees easily understood the Khmer term for malaria, *kruun chang*. This term was frequently interchanged with *g'dao k'lang* literally translated as strong heat, and *roung ngiem* the local term for exhaustion associated with malaria. People were able to describe signs and symptoms that they associate with malaria. Focus group participants were asked to categorize each sign or symptom they described as a sign, moderate symptom, or severe symptom. A severe symptom was defined as one that is life threatening, indicating the need for immediate attention from the health center or hospital. Both men and women provided similar information, although, women were able to describe signs and symptoms in more detail. The illustration below summarizes malaria signs and symptoms by village identification and case definition.

Illustration 1. Signs and symptoms of malaria: village recognition versus case definition[11]



There was no consensus or clear understanding of the degree of severity for convulsions/shaking and high fever; there was significant discussion in most focus groups about this as they were both identified as moderate and severe symptoms. There was some agreement that convulsions and high fever become very serious, but only after 2-3 days. This confusion can result in delayed care-seeking at the health center.

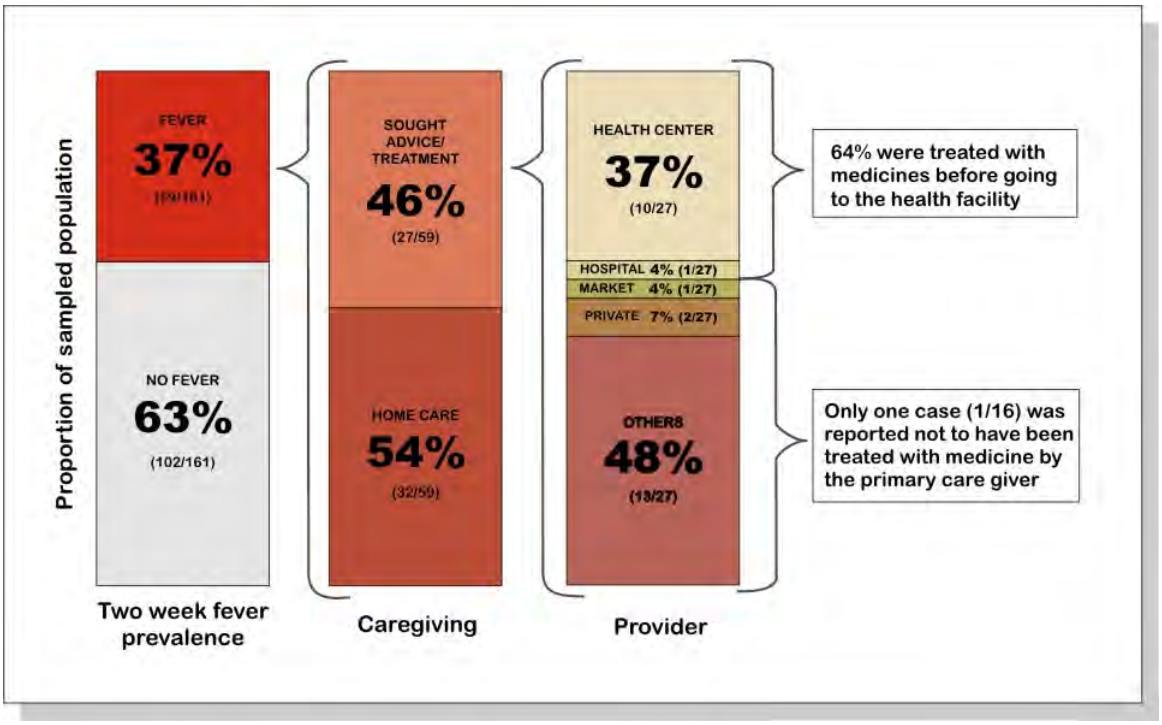
Villagers are able to identify remittent fever and chills (cold hands/legs) as a malaria sign. Sweating was not mentioned at all as a sign or symptom. This is likely due to the perception of sweating as normal (not surprising for rural Cambodia). Several other symptoms identified by villagers are being confused with other illness (cough, asthma or typhoid). Additionally, there is a common association of red with heat. Therefore, red urine should logically indicate overheating from high fever. This however, is not a symptom of malaria that follows the standard case definition.

[11] Case definitions taken from the *National Treatment Guideline for Malaria, National Centre for Parasitology, Entomology and Malaria Control, November 2004*, pp.7-8

Care-seeking behavior

According to the KPC survey, 37 percent of mothers reported that their youngest child had fever in the last two weeks. These mothers were asked more detailed questions concerning treatment and care seeking for this illness episode.

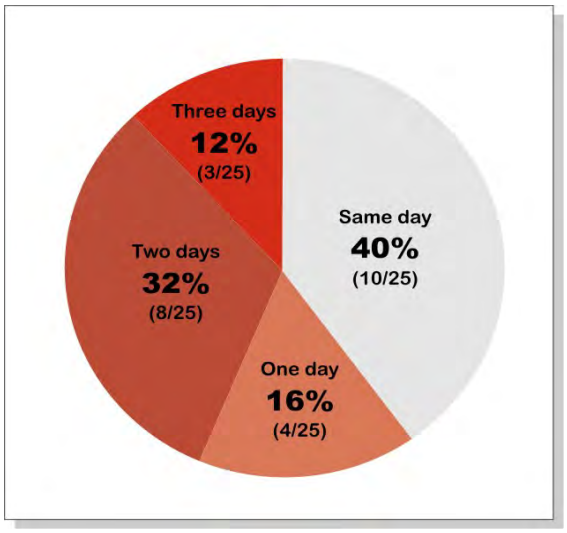
Graph 1. Report of care-seeking behavior among children with fever in the past two weeks (KPC)



Of caregivers reporting their youngest child had fever in the past two weeks during the KPC survey, 46 percent stated that they sought advice or treatment outside the home; 54 percent stated that they did not. Of those 27 cases reporting treatment outside the home, 10 cases went to the health center, 1 case went to the hospital, 1 case went to the market, and 2 cases went to a private provider; 13 cases reported "other", detail for "other" was not recorded at the time of the survey.

Among those cases going to the health center or hospital, 64 percent were treated with medicines before going to the facility. Among those cases going outside of the formal health sector (market, private provider, or other), only one case was reported not to have been treated with medicine by the primary caregiver. This data suggests that almost all fever is treated first by the primary caregiver; over half of first care/treatment for fever is administered in the home.

Chart 1. Time-lapse for fever care-seeking



Data from the KPC survey revealed that, for those reporting treatment outside the home, 40 percent reported care-seeking the same day as signs or symptoms appear; 16 percent report waiting one day; 32 percent report waiting two days; and, 12 percent cited waiting three days. A total of forty-four (44) percent reported waiting two or three days before seeking care compared to a total of fifty-six (56) percent reporting care-seeking within one day. This corroborates the focus group discussion finding that there is no consensus on when convulsions and fever become severe, and need referral to the health center or hospital.

Data from focus group discussions and in-depth interviews with villagers and key informants corroborates the quantitative findings described above, providing a more detailed account of what is happening with care-seeking for fever at the village level.

Following recognition of malaria signs, a mother typically forages on the mountain or around the village for traditional medicines such as the Persian lilac leaf and other non-specified, edible plants. These leaves are crushed with unheated water to make a tea. The tea is sponged or wrapped on the child's body with a soaked cloth to reduce the temperature. Some people give the tea to the child as a drink. This home treatment is commonly used for the first one to two days of the onset of signs.

Also, not uncommon, was report of food preparation to offer to the spirit. By contrast, mention of the consultation with *kru k'mai* or traditional healers/witch doctors was isolated.

If the child's symptoms persist or get worse, the mother will most frequently go to the shopkeeper for treatment advice and to purchase drugs. The most commonly mentioned drugs purchased from the village shopkeeper for malaria signs and symptoms included paracetamol, ampicine, tetracycline, novazine, quinine, powder ampicine, powder cloramphenical, yakhamchai, and sombucmum (both unidentified medicines from Thailand).

The national 1st line treatment guideline for *p. falciparum* malaria is artesunate +mefloquine; the 2nd line treatment guideline is quinine+tetracycline. The treatment for *p. vivax* and *p. malariae* is chloroquine. Drug dosages and delivery mechanism (suppository, syrup, tablet, and intramuscular or intravenous injection) vary depending on the drug type, patient's weight/age, and illness severity (uncomplicated or severe).

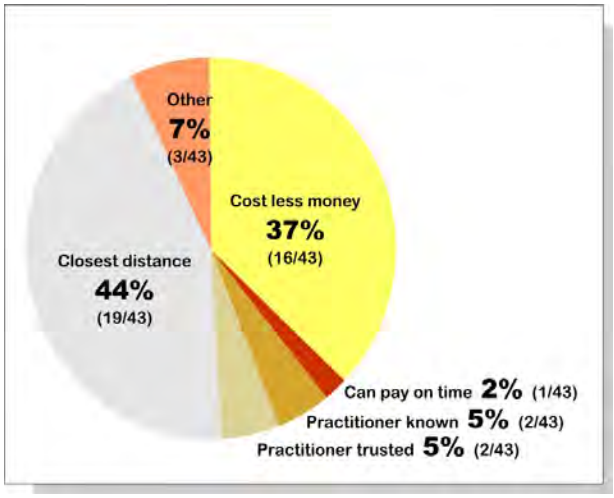
Focus group participants stated that caretakers seek care with the shopkeeper due to close distance, convenience and lack of resources for transportation to the health center. Quality of care at the health center was only mentioned by one person as a reason for seeking care first with shopkeepers.

Shopkeepers stated that people always come to them to discuss treatments. Shopkeepers reported their role to provide advice and treatments in the village. One shopkeeper explained, "*Many people come to ask me about what to do for their sick child. When they have fever I give them paracetamol because my supplier, the big pharmacy in Pourk, uses this for fever. If the sick child's condition has not improved after two days I will recommend that the mother takes the child to the health center or hospital."*

If the child's symptoms persist or get worse following self-treatment (after one to three days), most people reported that they will then take their child to the health center or hospital.

If this is not possible (no transportation, etc.) or if treatment at the health center is not effective, mothers will resort again to the preparation of traditional teas (described above) in the home. Noticeably absent from caregiver accounts was advice seeking from opinion leaders other than shopkeepers.

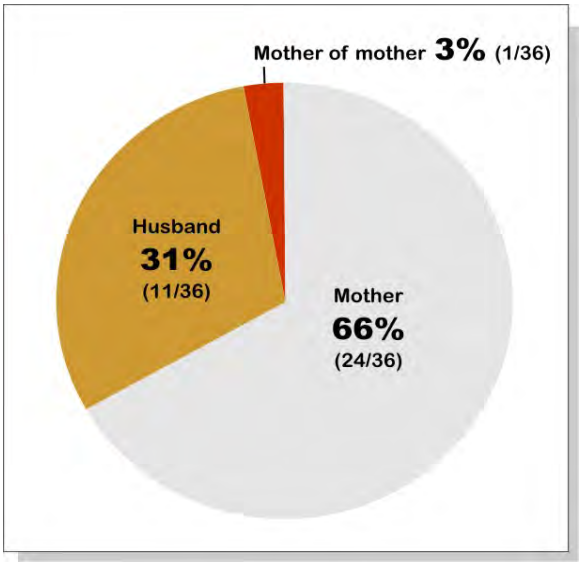
Chart 2. Reason child taken to chosen provider



The KPC survey quantified the children were taken to the chosen provider (multiple answers were recorded). Forty-four (44) percent of responses were related to closest distance. Thirty-seven (37) percent of responses included price as a reason. Other responses included knowing or trusting the practitioner, and the possibility to pay in installments.

Also of interest is decision-making regarding care-seeking practice. According to the KPC survey, less than one-third of husbands get involved with the decision to take their child for treatment. By contrast, key informants interviewed as part of the qualitative modules of the study perceive that the community is involved in decision-making regarding treatment. People involved include village health workers, village health support group members, family members, village leaders, elders, traditional birth attendants, and shopkeepers. One midwife stated, *"mothers consult with their village leader or the village health worker because they trust them and they believe they have been educated by the health center staff."* One village leader commented, *"I have advice from the district chief and information from the health center to give information to the community people when they get sick. It is my job to know what is going on in this community and the people always report to me when there is any problem. I am the leader of the people and when I say anything the people listen."* One village health worker noted, *"I am always the first to get information".*

Chart 3. Decision maker for care-seeking



Malacheck and malarine

Only one traditional midwife and one private clinic were able to identify *malacheck* as a rapid diagnostic test for malaria. In relation to *malarine*, approximately 20 percent of study participants were able to identify the packaging. Most focus group participants who were able to identify the product stated they had seen it on television advertisements. Those people were also knowledgeable about correct use and expressed confidence that it is very effective treatment for malaria. Furthermore, they understood that *malarine* is not for use by children under five years of age. Everybody noted that the price of *malarine* is expensive. One mother stated, "*malarine is very effective, but it is expensive. One box, it can cost up to 16,000 Riel. This medicine has very good quality."*

Recommendations

Prevention

Health education messages should reinforce the common understanding that malaria is caused by mosquito bites and the common belief that mosquito nets are important and beneficial. Villager concerns related to not having enough information about insecticide treatment needs to be addressed through interpersonal communication. This information is likely to generate demand for insecticide treatment.

Linking insecticide treatment to ongoing health center outreach activities was well received by mothers. This strategy should be expanded to all villages[12] with the goal of reaching at least 60-70 percent of households with at least one insecticide treated net to achieve the community-wide effect.[13,14] Insecticide treatment linked to outreach should remain a free or highly subsidized service to achieve the coverage target. Presently the MOH has no concrete plans for insecticide re-treatment in Angkor Chum OD.

Excessive washing of nets will likely reduce the effectiveness of insecticide treatment. Clear messaging needs to be developed and communicated to sensitize people to the appropriate washing interval. It is recommended that washing is done no more than once every three months. PSI plans to support the introduction of long lasting insecticide treated nets (LLIN). The insecticide on LLINs remains efficacious for approximately 21 washes, therefore washing every three months would render a LLIN effective for 5 years, at which point the net would likely need to be replaced due to tearing. Messaging to villagers to wash more frequently (as currently practiced) may be difficult to correct in the future.

Focus group participants perceived that a more recent insecticide treatment was not as effective as a previous treatment. Lice and bedbug elimination is an added benefit of insecticide treatment, but only following the first treatment. These pests are likely to develop pyrethroid resistance fairly soon after the introduction of insecticide.[15] This should be communicated to villagers.

Avoidance of people sick with malaria as a prevention measure should be addressed to reduce disease stigmatization. The identified link between illness and nutrition needs further exploration as part of planned future work on nutrition.

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[12] According to the *Report of the Cambodia National Malaria Baseline Survey 2004,* "There is considerable evidence of malaria transmission in the zone from 1 to 2 kilometers from the nearest forest. The risk is less than for those closer to the forest, but indicates the need for the control programme to include this zone in its control strategies."

[13] Maxwell CA et al. (December 2002) *Effect of community-wide use of insecticide-treated nets for 3-4 years on malarial morbidity in Tanzania*, Journal of Tropical Medicine and International Health, Volume 7 No 12, pp. 1003-1008

[14] Hawley WA et al. (2003) *Community-wide effects of permethrin-treated bednets on child mortality and malaria morbidity in western Kenya*, American Journal of Tropical Medicine and Hygiene, 68 (Supp. 4), pp. 121-127

[15] World Health Organization. (2003) *Malaria Vector Control: Decision Making Criteria and Procedures for Judicious Use of Insecticides*, p. 16

False beliefs relating to malaria transmission such as ingestion of bad water and cutting grass to eliminating breeding sites around the home (never proven to reduce malaria incidence[16]) have no negative consequence, and are best left unchallenged. However, they should not be encouraged.

A strategy is needed to address the issue of removing small children from under the mosquito net after dusk. PSI has suggested sewing insecticide treated material onto slings being used to carry children as a possible solution. A small pilot should be undertaken to explore the effectiveness of such an intervention.

The single de-motivating factor reported was the unpleasant smell of a new net. However, study participants stated that this would not deter them from using a mosquito net. No follow-up on this issue is considered necessary at this time.

Access to mosquito nets

The primary reason for non-use of mosquito nets is cost. Most mosquito net users want additional nets, citing that one net is not sufficient to protect their entire family. A segmented distribution scheme consisting of targeted net provision according to vulnerability and ability to pay is recommended to address these issues. High risk groups including children under two years of age and pregnant women, whom do not have resources to purchase a subsidized mosquito net, should be provided with a free net. Free nets should be used to incentivize ante-natal visits and other health services as appropriate at the health center. Subsidized and full cost nets should be made available for purchase by families interested in having additional nets for family members not at high risk.

Identification and referral

People need simple and clear information in order to accurately identify the malaria danger signs and know when it is time to seek care within the formal health sector.

Community opinion leaders view they have an important role to play in malaria control, they should be called upon to fulfill that role and provided with accurate information to support health promotion and referral.

A system needs to be set up to facilitate timely referrals to the health center.

Care-seeking

The subsidized sale of *malarine* through shopkeepers is problematic. The product is not widely available and the actual price is increased by up to six times the advertised retail price printed on the box. Health authorities have expressed that poor villagers often do not complete the prepackaged three-day course, as shopkeepers sell one or two days of

[16] Walker, K. (April 2002) *Environmental Health Project Activity Report 108, A Review of Control Methods for African Malaria Vectors*, p. 9

drugs if that is all that the costumer can afford. This is complicated by increased pricing in the village. Clearly, there is cause for concern about increased drug resistance.

Other drugs sold by village shopkeepers for the treatment of malaria are outside of the national treatment guidelines; by and large, shopkeepers are not selling effective or appropriate treatments. The result is a loss of scare resources and time, both of which could be better spent on acquiring effective treatment.

A comprehensive strategy, which offers villagers a viable alternative, with consideration to distance and pricing, is needed to effectively address this issue. The strategy should: (1) increase drug availability and access thru health centers and village malaria workers; (2) increase the number of village malaria workers; (3) increase the number of *malarine* sales agents, possibly involving Village Health Support Groups; (4) establish a monitoring plan with follow-up to stop retail mark ups on the suggested retail price; (5) educate caretakers of the ineffectiveness of alternative drugs provided by shopkeepers to shift demand to health centers, village malaria workers, and *malarine* sales agents; and, (6) engage opinion leaders in implementation.

Action Plan

A one-day stakeholder workshop was convened to achieve the defined goal *of aligning stakeholders in the development and implementation of a comprehensive, evidence-based strategy to overcome the challenges to effective malaria prevention and treatment in Angkor Chum Operational District*. The National Malaria Center (CNM), Provincial Health Department (PHD), Operational District (OD), Belgian Technical Cooperation (BTC), Population Services International (PSI), Reproductive and Child Health Alliance (RACHA), the Cambodian Red Cross (CRC), and the American Red Cross all participated. The workshop was held at the Angkor Chum Operational District office on November 25, 2005 and included a presentation of the study findings and recommendations followed by discussion to outline a joint action plan (see table 6).

Table 6. Planned Activities and Responsible Parties

Number	Activities	Responsible
1.	*Health education*	
1.1	Prevention, early identification, and referral training to field officers	ARC/CRC OD, RACHA
1.2	Prevention, early identification, and referral training to CRC volunteers	CRC, VMW
1.3	Prevention, early identification, and appropriate care-seeking (to shift demand to health centers, VMWs, and *malarine* sales agents) training to households	CRC volunteers
1.4	Engage community leaders in implementation	ARC/CRC
1.5	Media messaging (radio, advertisements)	PSI
1.6	Mobile Video Unit (MVU)	PSI
1.7	IEC materials development, provision of prototype	RACHA, CNM
1.8	Train VHSGs on diagnosis, primary care, and referral	further discussion

Table 6. continued

Number	Activities	Responsible
2.	*Insecticide treatment*	
2.1	Provision of insecticide (ARC to write request letter)	CNM, PHD
2.2	Organization of treatment stations linked to HC outreach	OD, ARC/CRC
2.3	Community mobilization to bring mosquito nets for treatment	ARC/CRC
2.4	Develop insecticide-treated sling for children removed from under the net at night	PSI
2.5	Pre-test and pilot insecticide-treated sling in 10 villages to demonstrate impact; explore potential for scale-up following results of pilot	ARC/CRC
3.	*Mosquito nets*	
3.1	Procurement of nets	PHD/OD, ARC/CRC
3.2	Free/heavily subsidized distribution to pregnant women via HCs	OD
3.3	Criteria development for free/heavily subsidized distribution to high risk poorest of the poor in the community	OD, ARC/CRC
3.4	Free/heavily subsidized community distribution	VHSG, CRC volunteers
3.5	Social marketing of subsidized nets	ARC/CRC, PSI
3.6	Monitoring for correct use	all
4.	*Increase drug availability and access*	
4.1	Ensure drug supply in the HCs	PHD, OD
4.2	Increase *Malarine* distributors in the community	PSI
4.3	Follow-up monitoring	OD to coordinate
4.4	Reduce inappropriate drug supply from community vendors	government authorities

All activities for which ARC and CRC are responsible have been integrated into the annual Integrated Child Health (ICH) Project work plan. Implementation of these activities will be done in close coordination with all stakeholders to ensure implementation of the comprehensive strategy.

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Participating Villages

Village	Commune	District	Method	Date
1. Prasat Trave	Kourk Doung	Angkor Chum	FGD	9/20/05: 9/27/05
2. Kamplerb	Kourk Doung	Angkor Chum	FGD: IDI	9/20/05
3. Kok Kandal	Lovea Krang	Varin	FGD	9/20/05
4. Ou Tey	Lovea Krang	Varin	FGD	9/20/05
5. Dom Em	Kourk Doung	Angkor Chum	FGD: IDI	9/20/05: 9/28/05
6. Romdul	Varin	Varin	FGD	9/21/05
7. Kok Krous	Varin	Varin	FGD	9/21/05
8. Toul Meat	Varin	Varin	FGD: IDI	9/21/05: 9/29/05
9. Rokar	Doun Peng	Angkor Chum	FGD	9/22/05
10. Chan Roun	Prasath	Varin	FGD	9/22/05
11. Vean	Prasath	Varin	FGD	9/22/05
12. Kor Rolum	Ta Saum	Angkor Chum	FGD	9/22/05
13. Nokor Pheas 1	Nokor Pheas	Angkor Chum	FGD	9/22/05
14. Nokor Pheas 2	Nokor Pheas	Angkor Chum	FGD	9/22/05
15. Reussey Thom	Svay Sar	Varin	FGD	9/23/05
16. Svay Sar	Svay Sar	Varin	FGD	9/23/05
17 Kor Chas	Sre Khvaoav	Angkor Chum	FGD	9/23/05
18. Korolum	Tasoam	Angkor Chum	IDI	9/26/05
19. Dambor	Svay Sar	Varin	IDI	9/30/05

Publications Consulted

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Annex I- Focus Group Discussion Guide 1- Malaria Prevention

Target Groups (CIRLE ONE):

(1) Female caregivers aged 19-49 of children <5 *doers (self-report of year-round mosquito net use);*
(2) Female caregivers aged 19-49 of children <5 *doers1 (self-report of seasonal mosquito net use);*
(3) Female caregivers aged 19-49 of children <5 *non-doers (self-report of no mosquito net use);*
(4) Married men aged 19-49 with children <5 *doers (self-report of year-round mosquito net use);*
(5) Married men aged 19-49 with children <5 doers1 *(self-report of seasonal mosquito net use only);*
(6) Married men aged 19-49 with children <5 *non-doers (self-report of no mosquito net use)*

I. Introduction

Welcome and thank you for taking time to participate in this discussion today. My name is [moderator] and this is [note-taker] and we are working with the Red Cross and Operational District to help find solutions to the problem of malaria. Your comments will be used to help the development of effective programming to improve malaria prevention and control.

II. Ground rules

We are interested in all your opinions and feelings. There are no right or wrong answers. We need your ideas, so any criticisms you have will not hurt our feelings. We encourage you to provide frank comments. We encourage you to share openly your ideas. Do not wait for the moderator to ask for your opinion, feel free to speak at any time. You will have a chance to speak and all ideas, concerns and opinions are of value. The session will last approximately 1-1.5 hours.

III. Confidentiality/Informed Consent

Everything that is said in this group is confidential and we will not tell anyone that you participated in this discussion. My assistant will take some notes and I will record this session to help us remember comments from the group.

I also want to make sure that everybody knows that your participation is voluntary. You are under no obligation to be here or participate in this group if you do not want to do so. You may leave at any time. Is there anybody who would prefer to leave at this time?

IV. Introduction of participants

We would like each of you to introduce yourself. Also, please tell us how many children you have and tell me the age of your youngest child.

V. Research questions

1.1 All of you said that you had a young child. Could you tell me what are the main illnesses of young children in your community?

1.2 Could you tell me what causes malaria?

1.3 Could you tell me how people in this village prevent malaria?

1.4 Can you tell me more about mosquito nets... what are some advantages to using one? PROBE: Please tell me more about that... What else?....

1.5 What are some disadvantages to using a mosquito net?... PROBE: Please tell me more about that... What else?....

FOR *doers* and *doers1* ONLY:

1.6 Everybody here told me that they have a mosquito net in their home. Can you tell me who sleeps under it every night?... PROBE: What about your small children? What about your youngest child?...

1.7 Is there ever a time when your youngest child does not sleep under the net? PROBE: Can you tell me more about that?... Why?...

1.8 Is there ever a time when your youngest child is removed from under the mosquito net after dusk?... PROBE: Can you tell me more about that?... Why?....

1.9 What could somebody do or say to make you want to always have your youngest child sleep under the net?.... PROBE: Can you tell me more about that?...

FOR non-doers ONLY

1.10 Have you ever considered using a mosquito net?...

1.11 What has stopped you from using one?....PROBE: What else?.. Can you tell me more about that?...

ALL

1.12 What could somebody do or say to make you want to use a mosquito net all year long?.... PROBE: Can you tell me more about that?...

1.13 Have you ever heard about KO-trine or insecticide treatment to dip/soak your mosquito net? Has anybody here used KO-trine or another insecticide treatment for soaking/dipping a mosquito net? PROBE: Can you tell me more about your experience with treating/re-treating a mosquito net?

1.14 During health center outreach, has the staff ever brought insecticide treatment for people to be able to re/treat their net here in the community?..

1.15 If the VMW or the health center outreach staff were to provide insecticide treatment during health center outreach, would you bring your net (if you had one) ?...

1.16 Let's suppose that you have a mosquito net, how much would you be willing to pay to have it treated with insecticide?

1.17 What are the *advantages* to KO-trine or insecticide treatment for a mosquito net?... PROBE: Can you tell me more about that?...

1.18 What are the *disadvantages* to KO-trine or insecticide treatment for a mosquito net?... PROBE: Can you tell me more about that?...

1.19 Is there anything that anybody could do or say that would convince you to seek insecticide treatment for your mosquito net? PROBE: Can you tell me more about that?...

VI. Wrap-up

We have discussed a lot of issues about malaria today. We want to thank you for your participation. Your comments and ideas you have shared will help us to better plan prevention promotion in your community. Before we finish, do you have any questions or us?

Annex 2- Focus Group Discussion Guide 2-Malaria Identification and Care-seeking

Target Group (CIRLE ONE):

(1) women caregivers 19-49 years of age with children <5; and
(2) married men aged 19-49 with children <5

I. Introduction

Welcome and thank you for taking time to participate in this discussion today. My name is [moderator] and this is [note-taker] and we are working with the Red Cross and Operational District to help find solutions to the problem of malaria. Your comments will be used to help the development of effective programming to improve malaria prevention and control.

II. Ground rules

We are interested in all your opinions and feelings. There are no right or wrong answers. We need your ideas, so any criticisms you have will not hurt our feelings. We encourage you to provide frank comments. We encourage you to share openly your ideas. Do not wait for the moderator to ask for your opinion, feel free to speak at any time. You will have a chance to speak and all ideas, concerns and opinions are of value. The session will last approximately 1-1.5 hours.

III. Confidentiality/Informed Consent

Everything that is said in this group is confidential and we will not tell anyone that you participated in this discussion. My assistant will take some notes and I will record this session to help us remember comments from the group.

I also want to make sure that everybody knows that your participation is voluntary. You are under no obligation to be here or participate in this group if you do not want to do so. You may leave at any time. Is there anybody who would prefer to leave at this time?

IV. Introduction of participants

We would like each of you to introduce yourself. Also, please tell us how many children you have and tell me how old is your youngest child.

V. Research questions

1.1 All of you said that you had a young child. Could you tell me what are the main illnesses of young children in your community?

1.2 I would like to talk more about malaria, could you tell me what causes malaria?

1.3 Could you tell me how you know that your child has malaria?... PROBE: Please tell me more about that... What else?.... Anything else?... RECORD ALL SYMPTOMS

GET AN EXHAUSTIVE LIST OF SYMPTOMS TO USE FOR Q1.4 AND Q1.5

1.4 I want to talk about each of the symptoms that were mentioned by the group. You told me that _____ (high fever, convulsions/shakes, etc.) indicate that your child has malaria. How serious is that symptom?...

IF GROUP HAS DIFFICULTY EXPRESSING THIS, USE THE LIKERT SCALE.

1.5 If your child has _____ (high fever, convulsions/shakes, etc.) what would you do first? What would you do next? And after that?... PROBE: Please tell me more about that....

REPEAT Q1.4 AND Q1.5 WITH EVERY SYMPTOM MENTIONED BY THE GROUP FROM QUESTION 1.3.

1.6 Have you ever used or heard of *malacheck*?... SHOW SAMPLE
PROBE: Can you tell me more about your experience with *malacheck*?

IF THEY HAVE NEVER HEARD OF *malacheck* SKIP TO Q1.10

1.7 What do you think of *malacheck?*... Is it worth the cost and effort to purchase in order to diagnose malaria? Why?....

1.8 What prevents people from using *malacheck* every time they suspect malaria?...

1.9 What could somebody do or say that would convince you to use *malacheck* every time you suspect your youngest child has malaria?... PROBE: Can you tell me more about that?...

1.10 Now I would like to talk about treatment for malaria. I know that different people use different treatments. When your youngest child (under 5 years of age) presents the symptoms [name symptoms] that we discussed earlier, what do you do?... PROBE: Can you tell me more about that?... What are the advantages/benefits to that treatment? After you do that, what do you do next?... What do you do if the symptoms do not improve?...

1.11 Do you give that child any medicines?... Which ones?... Why do you give your child [name medicine]?... PROBE: Can you tell me more about that medicine?... Where do you get those medicines?....

1.12 At what point do you decide that you need to go to the health center?... What alerts you that the situation is very serious?... What are the words that people use to identify that [symptom] is very serious?... REPEAT ALL MENTIONED SYMPTOMS FROM Q1.3 AND RECORD ALL MENTIONED WORDS INDICATING SERIOUSNESS

1.13 Sometimes you may talk with other people when your child gets sick with [symptoms], with whom to you talk and who gets involved in making the decision to take your child to the health center for care?.... PROBE: Please tell me more about that...

1.14 Who in this community could tell you to take your child to the health center that would obligate you to do so? Who else?... PROBE: Please tell me more about these people and why they have this influence...

1.15 What could somebody do or say that would make you want to seek care for your child at the health center?... PROBE: Please tell me more about that...

1.16 Have you ever used or heard of *malarine* for treatment of children over 5 years of age and adults?... SHOW SAMPLE; PROBE: Can you tell me more about your experience with *malarine*?

IF THEY HAVE NEVER HEARD OF *malarine* END FOCUS GROUP

1.17 What do you think of *malarine?...* Is it worth the cost and effort to purchase in order to treat malaria? Why?....

1.18 What prevents people from using *malarine* when their child over 5 years of age has malaria?...PROBE: Can you tell me more about that?....

1.19 What could somebody do or say that would convince you to use *malarine* every time your child over 5 years of age has malaria?... PROBE: Can you tell me more about that?...

VII. Wrap-up

We have discussed a lot of issues about malaria today. We want to thank you for your participation. Your comments and ideas you have shared will help us to better plan prevention promotion in your community. Before we finish, do you have any questions for us?

Annex III- In-Depth Interview Guide 2– Malaria Treatment

Target Groups (CIRCLE ONE):

(1) Commune or Village leader
(2) Village Malaria Worker (VMW)
(3) Mid-wife
(4) Shopkeepers

I. Introduction

Welcome and thank you for taking time to participate in this discussion today. My name is [interviewer] and I am working with the Red Cross and Operational District to help find solutions to the problem of malaria. Your comments will be used to help the development of effective programming to improve malaria prevention and control.

II. Ground rules

We are interested in all your opinions and feelings. There are no right or wrong answers. We need your ideas, so any criticisms you have will not hurt our feelings. We encourage you to provide frank comments. We encourage you to share openly your ideas. The interview will last approximately 1-1.5 hours.

III. Confidentiality/Informed Consent

Everything that you say in this interview is confidential and we will not tell anyone that you participated in this discussion. I will take some notes and record this session to help me remember your ideas.

I also want to make sure that you know that your participation in this interview is voluntary. You are under no obligation to be here or participate if you do not want to do so. Are you agreeable to continuing with the interview?

I. Introduction

Could you tell me about what you do for work?...

II. Research questions

1.1 I would like to talk to you about malaria, could you tell me what causes malaria?

1.2 Could you tell me how people in the village know that their child has malaria?...
PROBE: Please tell me more about that... What else?.... Anything else?...
RECORD ALL SYMPTOMS

1.3 Frequently, people in the village talk with other people when their child gets sick with [symptoms], with whom do they talk most? RECORD ALL MENTIONED
Where do people most commonly go for advice on treatment for malaria?
RECORD ALL MENTIONED

1.4 Do people ever ask you how to treat malaria?... How often do people consult with you? If somebody were to ask your advice on treating the symptoms you mentioned [name symptoms] what would you tell them?... PROBE: What else?... Can you tell me more about that?...

1.5 What medicines do you recommend?.. RECORD ALL MENTIONED Why would you recommend [name medicine]? PROBE: Can you tell me more about that one?... Do you believe it is effective?.... REPEAT TO EXHAUST ALL MENTIONED MEDICINES

1.6 In the village, who gets involved in making the decision to take a sick child to the health center for care?.... PROBE: Please tell me more about that...

1.7 In the village, who could tell a mother to take her child to the health center that would obligate her to do so? Who else?... PROBE: Please tell me more about these people and why they have this influence...

1.8 What could somebody do or say that would make a mother want to seek care for your child at the health center?... PROBE: Please tell me more about that...

1.9 What prevents people in the village from seeking care for a sick child at the health center? PROBE: What else? Please tell me more about that...

1.10 Have you ever used or heard of *malacheck*?... SHOW PRODUCT SAMPLE; PROBE: Can you tell me more about your experience with *malacheck*? Do people in the village use *malacheck*? Why or why not?...

IF THEY HAVE NEVER HEARD OF *malacheck* SKIP TO Q1.14

1.11 What do you think of *malacheck?*... Is it worth the cost and effort to purchase in order to diagnose malaria? Why?....

1.12 What prevents people in the village from using *malacheck* every time they suspect malaria?...

1.13 What could somebody do or say that would convince people in the village to use *malacheck* every time you suspect a child over 5 years of age has malaria?... PROBE: Can you tell me more about that?...

1.14 Have you ever used or heard of *malarine*?... SHOW PRODUCT SAMPLE PROBE: Can you tell me more about your experience with *malarine*?

IF THEY HAVE NEVER HEARD OF *malarine* END INTERVIEW

1.15 What do you think of *malarine?*... Is it worth the cost and effort to purchase in order to treat malaria? Why?....

1.16 What prevents people from using *malarine* when their child has malaria?...PROBE: Can you tell me more about that?....

1.17 What could somebody do or say that would convince people in the village to use *malarine* every time their youngest child has malaria?... PROBE: Can you tell me more about that?...

III. Wrap-up

We have discussed a lot of issues about malaria today. I want to thank you for your participation. Your comments and ideas you have shared will help us to better plan prevention promotion throughout Angkor Chum OD. Before we finish, do you have any questions for me?

Annex IV. Malaria modules extracted from the KPC questionnaire

VIII. MALARIA				
MA1	Has <NAME> been ill with fever in the last two weeks?	Yes	1	**If no or don't know, go to MA22**
		No	2	
		Don't not	8	
MA2	Did you seek advice or treatment for <NAME'S> fever?	Yes	1	**If no, go to MA22**
		No	2	
MA3	***Where did you <u>first</u> go for*** **Circle only one answer.** **If 1, 2, 3, or 4 (Hospital, Write the Name**	Hospital	1	
		Health Center	2	
		Private Hospital/Clinic	3	
		Private Practitioner	4	
		Village Health Worker/TBA/VHC	5	
		Traditional Healer	6	
		Market	7	
		Pharmacy	8	
		Community Distributors	9	
		Friend/Relative	10	
		Other	88	
MA4	How long after you noticed <NAME's> fever did you seek treatment from that person or place?	Same day	0	
		One day	1	
		Two days	2	
		Three days	3	
MA5	Why was <NAME> taken to this <PROVIDER>? Anything else? **Circle all answers.**	Cost less money	A	
		Can pay on time	B	
		Practitioner known	C	
		Practitioner trusted	D	
		Closest distance	E	
		Other	X	
MA6	Who decided that you should go Anything else? **Circle all answers.**	Mother	A	
		Husband	B	
		Mother of mother	C	
		Mother-in-law	D	
		Friend/Neighbors	E	
		Others	Z	
MA7	How was the child taken there?	Walk	1	
		Own transportation	2	
		Motor taxi	3	
		Friend	4	
		Car taxi	5	
		Other	96	

MA8	How much did it cost for transportation?			
MA9	Did you/they have to pay for the consultation and treatment?	Yes	1	**If no, go to MA11**
		No	2	
MA10	How much did you have to pay?			
MA11	After the health provider saw the child did s/he ask you to bring the	Yes	1	**If no, go to MA15**
		No	2	
MA12	Did you take <CHILD> back to the same health care provider?	Yes	1	**If yes, go to MA14**
		No	2	
MA13	If not, why?			**Go to MA15**
MA14	When did you take the child back?	Same day	1	
		One days	2	
		Two days	3	
		Three day	4	
		Other	5	
MA15	Where else did you go for advice Anything else? **Circle all answers.** **If A, B, C, or D (Hospital, Health Center or Private Write the Name** _____	Hospital	A	
		Health Center	B	
		Private Hospital/Clinic	C	
		Private Practitioner	D	
		Village Health	E	
		Traditional Healer/TBA/VHC/VH	F	
		Market	G	
		Pharmacy	H	
		Community Distributors	I	
		Friend/Relative	J	
		Nowhere else	K	
		Other	Z	
MA16	Did you consult with the VHV, VHC, TBA or Key Mother?	Yes	1	**If no, skip MA17**
		No	2	
MA17	What did they do? Anything else? **Circle all answers.**	Nothing	A	
		Refer	B	
		Health Education	C	
		Gave Treatment	D	
		Follow up	E	
		Other	X	

MA8	How much did it cost for transportation?			
MA9	Did you/they have to pay for the	Yes	1	**If no, go to MA11**
		No	2	
MA10	How much did you have to pay?			
MA11	After the health provider saw the child did s/he ask you to bring the	Yes	1	**If no, go to MA15**
		No	2	
MA12	Did you take <CHILD> back to	Yes	1	**If yes, go to MA14**
		No	2	
MA13	If not, why?			**Go to MA15**
MA14	When did you take the child	Same day	1	
		One days	2	
		Two days	3	
		Three day	4	
		Other	5	
MA15	Where <u>else</u> did you go for advice Anything else? **Circle all answers.** **If A, B, C, or D (Hospital, Write the Name**	Hospital	A	
		Health Center	B	
		Private Hospital/Clinic	C	
		Private Practitioner	D	
		Village Health	E	
		Traditional Healer	F	
		Market	G	
		Pharmacy	H	
		Community Distributors	I	
		Friend/Relative	J	
		Nowhere else	K	
		Other	Z	
MA16	Did you consult with the VHV,	Yes	1	**If no, skip MA17**
		No	2	
MA17	What did they do? Anything else? **Circle all answers.**	Nothing	A	
		Refer	<u>B</u>	
		Health Education	C	
		Gave Treatment	D	
		Follow up	E	
		Other	X	

Attention! Read and foloww below: *If <NAME> was ever taken to a Hospital or Health Center --> MA18* **If <NAME> was not ever taken to a Hospital or Health Center --> MA19**				
MA18	Was <NAME> treated with any	Yes	1	**If no or don't know,**
		No	2	
		Don't Know	8	
MA19	Was <NAME> treated with any	Yes	1	**If yes, go to MA20.**
		No	2	
		Don't Know	8	
MA20	Which medicines were given to **If mother cannot remember** **Circle the letter next to the** **For each medicine checked** How long after the fever did **Circle the answer**			
A	CHLOROQUINE	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
B	FANSIDAR	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
C	MEFLOQUINE	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
D	RECTOCAP SUPPOSITORY	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	

E	A+M2 (ENFANT)	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
F	A+M3 (ADOLESCENT)	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
G	A+M4 (ADULT)	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
H	QUININE	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
I	TETRACYCLINE	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
J	ARTESUNATE	Same Day (Day 0)	0	
		Day 1	1	
		Day 2	2	
		Day 3 +	3	
		Don't know	8	
MA21	**OTHER MEDICINES** **Circle all answers.**	Aspirin	A	
		Paracetamol	B	
		Co-Trimoxazole	C	
		Ampicillin/ Amoxillicin	D	
		Other	E	
		Unknown Medicine	F	
MA22	Were any of these injections?	Yes	1	
		No	2	
		Don't Know	8	

MA23	What causes malaria? Anything else? **Circle all answers, and write**	Mosquito Bites	A	
		Witchcraft	B	
		Intravenous drug use	C	
		Blood transfusions	D	
		Injections	E	
		Sharing Razor Blades	F	
		Kissing	G	
		Other	W	
		Other	X	
		Don't Know	Z	
IX.				
BE1	Do you have any bednets in your	Yes	1	**If no or don't know,**
		No	2	
		Don't Know	8	
BE2	May I see the bednet? **Observe if bednet is hung**	Hung over bed	1	
		Not hung	2	
BE3	Was the bednet ever soaked or	Yes	1	**If no or don't know,**
		No	2	
		Don't Know	8	
BE4	**Inspect bednet for holes or**	No obvious holes/tears = Good	1	
		Any visible holes/tears =	2	
BE5	How long ago was the bednet **Record answer in months** **Less than 1 month = 00** **Don't know = 99**	_____ months		
BE6	Have you or someone else in **Record the number of times.** **None = 00** **Don't know = 99**	_____ times		**If none, go to BE8**
BE7	How often do you wash your	Once a week	1	
		Once a month	2	
		Less than once a month	3	
BE8	How long have you had your **Write down the number of**			
BE9	Who slept under the treated **Circle all answers.**	Child <NAME>		
		(the one chosen for the interview)	A	
		Mother	B	
		Husband	C	
		Other	Z	

Insecticide Treatment Campaign
Activity Report

FY-2004 Child Survival and Health Grants Program (CSHGP)
Grant No. GHS-A-00-04-00007-00

Siem Reap, Cambodia
May, 2006

CAMBODIAN RED CROSS

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Cover photo taken by CRC ICH/EWS Information Officer

Summary

The Cambodian Red Cross implemented an insecticide treatment campaign on March 25 and 26, 2006. The activity resulted in the treatment of 1,702 mosquito nets in 12 of the most malaria vulnerable villages of Angkor Chum and Varin administrative district of Siem Reap province. The total number unduplicated, direct and indirect beneficiaries is 8,898. Approximately 3,915 people sleeping under these newly treated mosquito nets are protected from malaria. The intervention is expected to prevent the deaths of five children under the age of five years.

The campaign was undertaken with the strong collaboration and support from the National Malaria Center, the Siem Reap Provincial Health Department, the Angkor Chum Operational Health District, and Health Centers of Angkor Chum, Both, Svay Sor, and Varin, as well as the American Red Cross. The activity was carried out as part of the USAID-funded Siem Reap Integrated Child Health Project. The National Malaria Center (CNM), through local health authorities, donated the insecticide, valued at over half of the total activity cost. The cost per mosquito net treated (including training, field activity, and insecticide) is $1.15; or $0.51 per direct beneficiary.

This activity supports the joint malaria control action plan which was developed by stakeholders following the recommendations of malaria formative research recently completed in the Angkor Chum and Varin administrative districts.[1] The activity and joint action plan are directly linked to the Integrated Child Health Project's malaria control strategy, intermediate results, strategic objectives, and goal.

Background

Cambodia has the worst malaria mortality and morbidity rates in Southeast Asia and one of the highest rates of malaria drug resistance in the world.[2] According to the National Health Statistics Report 2003, malaria is the third most common cause of outpatient attendance, the fifth main health problem among inpatients, and the second most common cause of hospital mortality.

The American Red Cross (ARC) is working with the Cambodian Red Cross (CRC) to implement an Integrated Child Health (ICH) Project funded by United States Agency for International Development (USAID). The goal of the ICH Project is to reduce child morbidity and mortality in a sustainable fashion in Angkor Chum Operational Health District of Siem Reap Province, Cambodia. Insecticide treatment of mosquito nets is

[1] Kolesar R. January, 2006 *Understanding Malaria Prevention and Control in Rural Cambodia: A formative research study*, Siem Reap, Cambodia
[2] http://www.cambodia.net/malaria/facts.html, retrieved January 17, 2006

linked to the Integrated Child Health (ICH) Project's malaria control strategy, and support the achievement of the project's intermediate results, strategic objectives, and goal.[3]

In September 2005, a formative research study was undertaken to fine tune malaria control interventions in Angkor Chum and Varin administrative districts. The American Red Cross and Cambodian Red Cross worked in partnership with numerous stakeholders to carry out the study. The National Malaria Center, the Siem Reap Provincial Health Department, and the Angkor Chum Operational District with support from the Belgian Technical Cooperation (BTC), Reproductive and Child Health Alliance (RACHA), and Population Services International (PSI) were all involved in various aspects of the research.

The study findings and recommendations were reviewed by during a one-day stakeholder workshop at the Angkor Chum Operational Health District office. That workshop resulted in the development of a malaria control joint action plan detailed in table 1 below.

Table 1. Planned Activities and Responsible Parties

Number	Activities	Responsible
1.	*Health education*	
1.1	Prevention, early identification, and referral training to field officers	ARC/CRC OD, RACHA
1.2	Prevention, early identification, and referral training to CRC volunteers	CRC, VMW
1.3	Prevention, early identification, and appropriate care-seeking (to shift demand to health centers, VMWs, and *malarine* sales agents) training to households	CRC volunteers
1.4	Engage community leaders in implementation	ARC/CRC
1.5	Media messaging (radio, advertisements)	PSI
1.6	Mobile Video Unit (MVU)	PSI
1.7	IEC materials development, provision of prototype	RACHA, CNM
1.8	Train VHSGs on diagnosis, primary care, and referral	further discussion
Number	**Activities**	**Responsible**
2.	*Insecticide treatment*	
2.1	Provision of insecticide (ARC to write request letter)	CNM, PHD
2.2	Organization of treatment stations linked to HC outreach	OD, ARC/CRC
2.3	Community mobilization to bring mosquito nets for treatment	ARC/CRC
2.4	Develop insecticide-treated sling for children removed from under the net at night	PSI
2.5	Pre-test and pilot insecticide-treated sling in 10 villages to demonstrate impact; explore potential for scale-up following results of pilot	ARC/CRC

[3] Kolesar R, Ricca J, Willard A, Edwards N, Ram S, June, 2005 *Siem Reap Integrated Child Health Project, Detailed Implementation Plan,* Phnom Penh, Cambodia

(table 1 continued)

3.	*Mosquito nets*	
3.1	Procurement of nets	PHD/OD, ARC/CRC
3.2	Free/heavily subsidized distribution to pregnant women via HCs	OD
3.3	Criteria development for free/heavily subsidized distribution to high risk poorest of the poor in the community	OD, ARC/CRC
3.4	Free/heavily subsidized community distribution	VHSG, CRC volunteers
3.5	Social marketing of subsidized nets	ARC/CRC, PSI
3.6	Monitoring for correct use	all
4.	*Increase drug availability and access*	
4.1	Ensure drug supply in the HCs	PHD, OD
4.2	Increase *Malarine* distributors in the community	PSI
4.3	Follow-up monitoring	OD to coordinate
4.4	Reduce inappropriate drug supply from community vendors	government authorities

Following-up on the joint action plan, CRC volunteer groups in all 254 participating villages of Angkor Chum Operational Health district were trained in malaria transmission, prevention, and early identification and referral from January through March, 2006. In turn, each CRC volunteer completed approximately 20 home visits to motivate improved health practices among all caretakers in their respective communities. Interpersonal communication with each household was undertaken prior to the insecticide treatment campaign. As detailed in the joint action plan (above), activities 2.1, 2.2, and 2.3 relate to insecticide treatment of existing mosquito nets.[4]

Activities

Training

ICH project staff were initially trained on malaria control, including an overview of insecticide treatment, from December 26-27, 2005. A follow-up training, focusing on communication skills related to malaria control messaging was conducted on February 3, 2006. A one-day training focusing exclusively on insecticide treatment was jointly planned and organized by the PHD malaria technical expert, the CRC ICH interim project manager, and the AmCross ICH technical training officer. The training was conducted on March 10, 2006 at the Angkor Chum Operation Health District office. Both the training agenda (Annex 1), and the participant list (Annex 2) are attached to this report. The training was interactive with practice sessions to ensure participants mastered the skills needed to undertake insecticide treatment activities in the targeted villages. The training also included preliminary logistics planning for the campaign.

[4] Due to staffing issues, the activity was not linked to health center outreach as originally planned.

Planning & Logistics
Twelve (12) of the most malaria vulnerable villages in Angkor Chum and Varin districts were prioritized by the PHD malaria expert. CRC ICH field officers visited each priority village. Working with village leaders and CRC volunteers in each of the target villages, a campaign schedule was developed; village leaders and CRC volunteers announced the treatment activity throughout their respective villages.

Additionally, a mosquito net census was conducted in the target villages from March 13-24. Nets were counted and classified according to condition (new/old) and size (small/medium/large). A total of 1,817 mosquito nets were counted. Annex 3 details the mosquito net census results by village. A summary table is shown below.

Table 2. Summary of mosquito net census and total nets treated by village

No.	Village	Commune	Family member		Number of Children		Total Net Census	Total Nets Treated
			Total	Female	<2 years old	2-3 years old		
1	Kouk Kandal	Loveakrang	779	381	28	76	172	175
2	Kouk Chan	Loveakrang	938	484	75	112	289	265
3	Sre Samuth	Sre Noy	911	451	102	158	132	85
4	Kouk Srok	Varin	1130	568	101	155	208	170
5	Kouk Phnom	Varin	829	409	102	154	146	164
6	Neil	Varin	280	173	30	39	39	95
7	Toul Lmeath	Varin	833	452	82	127	195	133
8	Kanhchunh Run	Prasat	1130	580	95	80	274	172
9	Vean	Svay Sor	447	286	51	91	142	158
10	Cha	Svay Sor	325	176	30	24	75	84
11	Slat	Sre Khvav	755	394	46	72	100	80
12	Sre Braing	Sre Khvav	541	291	0	0	45	121
Totals			**8898**	**4645**	**742**	**1088**	**1817**	**1702**

A final coordinating meeting was conducted on the afternoon of March 24 at the ICH project office in Angkor Chum. Twenty-three staff from the Cambodian Red Cross (9), four health centers (8), and the American Red Cross (6) were divided into four field teams. Target villages were grouped by geographic proximity and assigned to the teams. The field team lists and assigned villages are detailed in Annex 4. Due to travel distances, teams were deployed on the afternoon of March 24, and stayed overnight in the villages on March 24 and 25.

A central location in each target village, usually where health center outreach sessions occur, was used to set up the insecticide treatment station. Before beginning insecticide treatment in the village, each team reviewed appropriate mosquito net care and use with

beneficiaries. Mosquito net washing following treatment was discouraged. Typically, each treatment station was running from 1 to 2 hours as many people came late. No villagers were turned away. The teams waited for approximately 20 minutes from the last treatment before packing up and moving on to the next site.

Insecticide Treatment
The National Malaria Center, through the Provincial Health Department and the Operational Health District, provided 60 bottles of icon® 2.5 CS, synthetic pyrethroid lambda-cyhalothrin insecticide (300 milliliters/bottle) to use for the campaign.

Results

Beneficiaries
The mosquito net census counted a total of 1,817 nets in the 12 villages. The total number of nets treated was 1,702, or 94 percent of the target. Some villages reported lower than expected turn out on the campaign day due to villagers visiting or working outside of the village. At least one village had lower than expected turn out due to a funeral.

Assuming that 2.3 people sleep under one mosquito net[5], the treatment of 1,702 nets is expected to protect 3,915 people. The protective effect of insecticide treatment lasts for a minimum of six months following treatment. Therefore, the total people-years of protection achieved as a result of the campaign is 1,957; or, 3,915 people protected for half a year. Assuming (conservatively) that half of the people sleeping under these nets will be children under five years of age yields the equivalent of 979 children under the age of five protected for one-year. As 1000 mosquito nets are expected to save 5.5 lives over a one-year period[6], protecting 979 children can be expected to save five lives. Additionally, malaria morbidity, and its associated economic burden, can be expected to significantly reduce in the target villages.

Villagers who came to the treatment station with mosquito nets (participating beneficiaries) were asked their names and number of nets they brought for treatment. Nine-hundred twenty three (923) people brought mosquito nets for treatment, yielding the average number of mosquito nets brought for treatment per participating beneficiary to be 1.84. It is known that many participating beneficiaries also brought their neighbors' nets for treatment (e.g. non-participating beneficiary nets); however, the total number of households which had a net treated was not recorded during the campaign. It is recognized that many households have more than one mosquito net and some household have none.

Table 3 below details coverage achievement by population and households. According to the *Report of the Cambodia National Malaria Baseline 2004*, "sufficient" is defined as 2.3 people per mosquito net. "Within Southeast Asia, a commonly used index of

[5] The *Report of the Malaria National Baseline Survey 2004* defines 'sufficient' as one net for 2.3 people; therefore, 2.3 has been used to calculate the average number of people sleeping under one net.
[6] Lengeler C. Issue 2, 2004 *Insecticide treated bednets and curtains for preventing malaria*

coverage is the number of people divided by the number of nets (i.e. the people: net ratio). It is also a convention, within Cambodia, and we believe also regionally, to use 'less than 2.3 people per net' as the standard for this index, in order to define programme targets and to estimate procurement needs."

However, interpretation of the net ratio should be made with caution. According to the same *Report of the Cambodia National Baseline Survey, 2004*, "setting a required standard of 1 net for every 2.3 people may be excessively demanding." "The survey data suggest that this is NOT an appropriate cut-off for "sufficient" in this setting, i.e. it is excessively rigorous." And, "that very high levels of net use occur [among children under 5] even with people:net ratios of >2.3." The report further states that, "The overall person:net ratio in the survey population was 2.6, and this was sufficient to give a usage rate in under-five children of almost 90%."

Table 3. Coverage Achievement

No.	Village	Population Census	Target nets to achieve "sufficient"	Total Nets Treated	Percentage of Target reached	Treated Net Ratio	Households	Total Nets Treated	Ratio of nets treated to households
1	Kouk Kandal	779	339	175	51.7	4.5	148	175	1.2
2	Kouk Chan	938	408	265	65.0	3.5	176	265	1.5
3	Sre Samuth	911	396	85	21.5	10.7	171	85	0.5
4	Kouk Srok	1130	491	170	34.6	6.6	208	170	0.8
5	Kouk Phnom	829	360	164	45.5	5.1	195	164	0.8
6	Neil	280	122	95	78.0	2.9	39	95	2.4
7	Toul Lmeath	833	362	133	36.7	6.3	167	133	0.8
8	Kanhchunh Run	1130	491	172	35.0	6.6	219	172	0.8
9	Vean	447	194	158	81.3	2.8	148	158	1.1
10	Cha	325	141	84	59.4	3.9	63	84	1.3
11	Slat	755	328	80	24.4	9.4	138	80	0.6
12	Sre Braing	541	235	121	51.4	4.5	102	121	1.2
Totals		**8898**	**3869**	**1702**	**44.0**	**5.2**	**1774**	**1702**	**1.0**

In reference to Table 3 above, *target nets to achieve "sufficient" coverage* was calculated by dividing the village populations by 2.3. *Percentage of target reached* was calculated by dividing *target nets to achieve coverage* by *total nets treated*. The *treated net ratio* average is 5.2 with a range of 2.8 to 10.7.

Although household coverage data was not collected as part of the campaign (see above), the number of treated nets divided by the total number of households reveals the ratio of treated nets to households, averaging 1.0 with a range of 0.5 to 2.4.

Overall, this data suggests that the campaign achieved coverage rates in excess of the 70 percent needed to achieve the community-wide effect[7,8] in ten of the villages. The community-wide effect is an overall reduction in malaria transmission for both net users and non-users, which has been proven to result from high levels of insecticide treated bed nets within a community. Thus, it is likely that all 7,232 villagers from these ten villages will directly or indirectly benefit from the treatment activity. Therefore, the total number unduplicated, direct and indirect beneficiaries is 8,898. This is calculated by adding the total populations of the ten villages achieving coverage rates in excess of 70 percent and direct beneficiaries of Sre Samuth and Slat villages, which achieved *nets treated to households ratios* of 0.5 and 0.6, respectively.

Cost-Effectiveness

Total cost per mosquito net treated (including training, field activity, and insecticide) is $1.15 (total activity cost divided by total number of nets treated); or $0.51 per direct beneficiary (total activity cost divided by total direct beneficiaries). The National Malaria Center, through the local health authorities, generously donated the insecticide with an estimated value of $1080. Therefore, the total cost to the Integrated Child Health (ICH) Project per mosquito net is $0.50 per unit or $0.22 per direct beneficiary. A budget estimate for per diems, accommodation, fuel, and supplies for both training and field work related to insecticide treatment is detailed in table 4 below.

Table 4. Training and field activity costs

Training		
No.	**Description**	**US$**
1	Per diems/accommodation-MOH staff	209.50
2	Per diems/accommodation-ICH staff	80.00
3	Fuel (estimated)	10.00
4	Supplies	124.65
	sub-total	*424.15*
Field Activity		
1	Per diems/accommodation-MOH staff	209.00
2	Per diems/accommodation-ICH staff	96.50
3	Fuel (estimated)	91.00
4	Supplies	51.45
	sub-total	*447.95*
	Total cash cost	*872.10*
5	Insecticide	1080.00
	GRAND TOTAL	**1952.10**

[7] Maxwell CA et al. (December 2002) *Effect of community-wide use of insecticide-treated nets for 3-4 years on malarial morbidity in Tanzania*, Journal of Tropical Medicine and International Health, Volume 7 No 12, pp. 1003-1008

[8] Hawley WA et al. (2003) *Community-wide effects of permethrin-treated bednets on child mortality and malaria morbidity in western Kenya*, American Journal of Tropical Medicine and Hygiene, 68 (Supp. 4), pp. 121-127

Annex 1. Training agenda

INTEGRATED CHILD HEALTH
Insecticide Net Treatment Refresher Course
Date: 10 March, 2006

Objective: to provide the CRC field officers, outreach staff and OD staff refresher on insecticide bed net treatment and campaign planning

Venue: Angkor Chum Operation District Office

Date: March 10, 2006
Chair Person: Pen Monorom, Technical Training Officer of ARC
Facilitator: Dr. Sam Chheng, PHD Trainer
Logistics: Mr. Chum Sophal
Participant : 06 CRC Field Officers
02 CRC Operation Managers
04 ARC staffs
02 OD Staffs
08 Health Center staff (from 4 HCs)
Total: 22 participants

TIME	CONTENTS	FACILITATOR
8:00 –8:15	Registration	Mr. Sophal
8:15-9:30	Lesson: Insecticide Treatment Process	Dr. Sam Chheng
9:30-9:45	Break and Snack	Mr. Sophal
9:45-10:00	Game	Mr. Monorom
10:00-12:00	Lesson: Insecticide Treatment (continue)	Dr. Sam Chheng
12:00	Lunch	
2:00 – 3:30	Practice in The classroom	Dr. Sam Chheng
3:30 – 3:45	Break and Snack	Mr. Sophal
3:45 – 5:00	Present the plan for Insecticide Treatment Campaign	Mr. Pen Monorom
5:00-5:30	Final Evaluation	Dr. Sam Chheng

Annex 2. Participant training list

Integrated Child Health Project
Name list of Participants for Insecticide Treatment Refresher
Date: March 10, 2006

No	*Name (English)*	*Name (Khmer)*	*Sex*	*Position*	*Signature*
1	Mr. Sor Sara	លោក ស សារ៉ា	M	AmCross ICH Project Coordinator	
2	Mr. Chum Sophal	លោក ជុំ សុផល់	M	AmCross Admin-Manager	
3	Mr. Pen Monorom	លោក មនោរម្យ	M	AmCross ICH Technical Training officer	
4	Mr. Kim Morn	លោក គីម ម៉ុន	M	AmCross Driver	
5	Mr. Roth Rumnea	លោក រ័ត្ន រម្យនា	M	AmCross ICH A/Project manager	
6	Mr. Phoung Sam On	លោក ភួង សំអូន	M	CRC ICH Project Operation Manager	
7	Mr. Soung Sar	លោក សួង សរ	M	CRC ICH Field Officer	
8	Mr. Oun Eat	លោក អួន អ៊ាត	M	CRC ICH Field Officer	
9	Mr. Eang Kang	លោក អ៊ាង កង	M	CRC ICH Field Officer	
10	Mr. Ouch Yorn	លោក អ៊ុច យន	M	CRC ICH Field Officer	
11	Mr. Phoeun Chy	លោក ភឿន ជី	M	CRC ICH Field Officer	
12	Mr. Kroch Soan	លោក ក្រូច ស៊ុន	M	CRC ICH Field Officer	
13	Dr. Sam Chheng	វេជ្ជៈបណ្ឌិត សំឆេង	M	PHD Malaria Expert	
14	Mr. Krouch Samoeun	លោក ក្រូច សាមឿន	M	OD	
15	Mr. Va Kimhout	លោក វ៉ា គីមហួត	M	OD	
16	Mr. Eth Doth	លោក អ៊ិត ឌុច	M	Varin Health Center staff	

17	Mr Ny Danin	លោក នី ដានីន	M	Varin Health Center staff	
18	Mr. Peuy Penh	លោក ពើយ ពេញ	M	Both Health Center staff	
19	Mr. Thang Chamroun	លោក ថាង ចំរើន	M	Both Health Center staff	
20	Mrs. Lem Sophal	អ្នកស្រី ឡែម សុផល	F	Svay Sor Health Center staff	
21	Mr. Keo Mork	លោក កែវ មុក	M	Svay Sor Health Center staff	
22	Mr. Nop Vanny	លោក ណុប វ៉ាន់នី	M	Angkor Chum Health Center staff	
23	Mrs. Muth Phalla	អ្នកស្រី មុត ផលា	F	Angkor Chum Health Center staff	
24	Mr. Robert Kolesar		M	AmCross ICH Project Director	
25	Mr. Hang Sana		M	CRC ICH Liaison Officer	

Annex 3. Mosquito net census and campaign treatment result by village

No.	Village	Commune	Family member		Number of Child		Number of Nets							Nets Treatment Campaign Result
							New Nets			Old Nets			Total of Net	
			Total	Female	<2 year	3-2 year	Small	Mediem	Big	Small	Mediem	Big		
1	Kouk Kandal	Loveakrang	779	381	28	76	3	1	0	18	129	24	172	175
2	Kouk Chan	Loveakrang	938	484	75	112	13	31	14	18	139	74	289	265
3	Sre Samuth	Sre Noy	911	451	102	158	30	11	34	30	7	20	132	85
4	Kouk Srok	Varin	1130	568	101	155	0	0	0	76	130	2	208	170
5	Kouk Phnom	Varin	829	409	102	154	1	0	0	15	123	7	146	164
6	Neil	Varin	280	173	30	39	0	0	0	4	34	1	39	95
7	Toul Lmeath	Varin	833	452	82	127	50	1	22	94	3	25	195	133
8	Kanhchunh Run	Prasat	1130	580	95	80	34	7	5	106	64	58	274	172
9	Vean	Svay Sor	447	286	51	91	37	20	5	20	40	20	142	158
10	Cha	Svay Sor	325	176	30	24	49	0	0	0	5	0	75	84
11	Slat	Sre Khvav	755	394	46	72	0	0	3	20	0	77	100	80
12	Sre Braing	Sre Khvav	541	291	0	0	0	0	0	14	2	29	45	121
Totals			**8898**	**4645**	**742**	**1088**	**217**	**71**	**83**	**415**	**676**	**337**	**1817**	**1702**

Annex 4. Field teams lists

Integrated Child Health Project

Participant List

For March 25-26 Net Insecticide Treatment Campaign

Group I

No	Nam	Organization	Location	Village	Commune
1	Chum Sophal	ARC, Addmin Officer	Phnom Penh	1-Kouk Kandal 2- Kouk Chan 3- Sre Samuth	1-Sre Noy 2-Lovea Krang
2	Hel Kim Morn	ARC, Driver	Angkor Chum		
3	Phuong Sam On	CRC, ICH Om	Angkor Chum		
4	Suong Sar	CRC, ICH FO	Angkor Chum		
5	Eth Doth	Chief HC	Varin		
6	Ny Danin	HC Staff	Varin		

Group II

No	Nam	Organization	Location	Village	Commune
1	Robert Kolesar	ARC, Project Director	Angkor Chum	1-Kouk Phnom 2-Kouk Srok 3- Neil	1- Varin Commune
2	Roth Rumnea	CRC, ICH OM	Angkor Chum		
3	Uon Eat	CRC, ICH FO	Angkor Chum		
4	Peuy Penh	Chief HC	Both		
5	Thang Chamroen	HC Staff	Both		
6	Pen Monorom	ARC ICH TTO	Angkor Chum		
7	Sok Kumthea	ARC ICH Ad/Finance	Angkor Chum		

Group III

No	Nam	Organization	Location	Village	Commune
1	Hang Chansana	ICH Liaison Officer	Phnom Penh	1-Toul Lmeath 2- Kanhchornh Run 3- Vean 4-Cha	1-Varin 2-Prasat 3- Svay Sor
2	Earn Kang	CRC, ICH FO	Angkor Chum		
3	Lem Sophal	HC Staff	Svay Sar		
4	Kao Mok	Chief HC	Svay Sar		
5	Kroch Samoeun	OD staff	Angkorchum		
6	Phon Navuth	ARC Driver	Phnom Penh		

Group IV

No	Nam	Organization	Location	Village	Commune
1	Kroch Soun	CRC, ICH,FO	Angkor Chum	1-Slath 2- Sre Braing	1- Sre Khvav
2	Phoeun Chhy	CRC, ICH,FO	Angkor Chum		
3	Nop Vanny	HC Staff	Angkor Chum		
4	Uch Yorn	CRC, ICH,FO	Pouk District		

Integrated Child Health Project

Activity Report II

Insecticide Treatment Campaign

FY-2004 Child Survival and Health Grants Program (CSHGP)
Grant No. GHS-A-00-04-00007-00

Siem Reap, Cambodia
September, 2006

CAMBODIAN RED CROSS

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I. Summary

The Cambodian Red Cross implemented a second insecticide treatment campaign on June 5 and 6, 2006. This activity resulted in the treatment of an additional 660 mosquito nets in five malaria vulnerable villages of Angkor Chum and Varin administrative districts of Siem Reap province. The total number of unduplicated, direct and indirect beneficiaries is 3,101. Approximately 1,518 people sleeping under these newly treated mosquito nets are protected from malaria. This second campaign is expected to avert two child deaths.[1]

The activity was carried out as part of the USAID-funded Siem Reap Integrated Child Health Project. The campaign was undertaken with strong collaboration and support from the National Malaria Center, the Siem Reap Provincial Health Department, the Angkor Chum Operational Health District, and Health Centers of Angkor Chum, and Svay Sor, as well as the American Red Cross. The first campaign was carried out on March 25-26 in 12 priority villages resulting in the treatment of 1,702 bed nets. A detailed account and analysis of the first campaign can be found in the *Insecticide Treatment Campaign Activity Report* (May, 2006).

Collectively, the campaigns achieved insecticide treatment of 2,362 bed nets, directly benefiting 5,433 villagers in 17 communities. The average cost per net treated is $1.06, or $0.46 per direct beneficiary. Collectively, the campaigns are expected to prevent seven child deaths. Summary results from both activities, as well as the total achievement, are shown in Table 1 below.

Table 1. Summary Results from Phase I and II Insecticide Treatment Campaigns

Description	Phase I	Phase II	Total / Average
1. Dates	March 25-26	June 4-5	-
2. Villages	12	5	17
3. Nets treated	1702	660	2362
4. Direct beneficiaries	3915	1518	5433
5. Cost per net	$0.69	$1.39	$1.06*
6. Cost per beneficiary	$0.30	$0.60	$0.46*
7. Child deaths averted	5	2	**7**
8. Cost per life saved	$233.59	$457.35	**$358.11***

*includes training costs in calculation

Insecticide treatment of bed nets supports the joint malaria control action plan developed by stakeholders following the recommendations of malaria formative research recently completed in the Angkor Chum and Varin administrative districts.[2] The activity and joint action plan are directly linked to the Integrated Child Health Project's malaria control strategy, intermediate results, strategic objectives, and goal.

[1] Beneficiary and deaths averted calculations are detailed in Section IV. Results, Beneficiaries

[2] Kolesar R. January, 2006 *Understanding Malaria Prevention and Control in Rural Cambodia: A formative research study*, Siem Reap, Cambodia

II. Background

Cambodia has the worst malaria mortality and morbidity rates in Southeast Asia and one of the highest rates of malaria drug resistance in the world.[3] According to the National Health Statistics Report 2003, malaria is the third most common cause of outpatient attendance, the fifth main health problem among inpatients, and the second most common cause of hospital mortality. The American Red Cross (AmCross), with funding from the United States Agency for International Development (USAID) Child Survival and Health Grants Program, is providing financial and technical support to the Cambodian Red Cross (CRC) to implement the Integrated Child Health (ICH) Project. The goal of the ICH Project is to reduce child morbidity and mortality in a sustainable fashion in Angkor Chum Operational Health District of Siem Reap province, Cambodia. Insecticide treatment of mosquito nets is linked to the Integrated Child Health (ICH) Project's malaria control strategy, and supports the achievement of the project's intermediate results, strategic objectives, and goal.[4]

In September 2005, a formative research study was undertaken to fine tune malaria control interventions in Angkor Chum and Varin administrative districts. The American Red Cross and Cambodian Red Cross worked in partnership with numerous stakeholders to carry out the study. The National Malaria Center, the Siem Reap Provincial Health Department, and the Angkor Chum Operational District with support from the Belgian Technical Cooperation (BTC), Reproductive and Child Health Alliance (RACHA), and Population Services International (PSI) were all involved in various aspects of the research.

The study findings and recommendations were reviewed during a one-day stakeholder workshop at the Angkor Chum Operational Health District office. That workshop resulted in the development of a malaria control joint action plan detailed in table 2 below.

Table 2. Planned Activities and Responsible Parties

Number	Activities	Responsible
1.	*Health education*	
1.1	Prevention, early identification, and referral training to field officers	ARC/CRC OD, RACHA
1.2	Prevention, early identification, and referral training to CRC volunteers	CRC, VMW
1.3	Prevention, early identification, and appropriate care-seeking (to shift demand to health centers, VMWs, and *malarine* sales agents) training to households	CRC volunteers
1.4	Engage community leaders in implementation	ARC/CRC
1.5	Media messaging (radio, advertisements)	PSI
1.6	Mobile Video Unit (MVU)	PSI
1.7	IEC materials development, provision of prototype	RACHA, CNM
1.8	Train VHSGs on diagnosis, primary care, and referral	further discussion

[3] http://www.cambodia.net/malaria/facts.html, retrieved January 17, 2006
[4] Kolesar R, Ricca J, Willard A, Edwards N, Ram S, June, 2005 *Siem Reap Integrated Child Health Project, Detailed Implementation Plan,* Phnom Penh, Cambodia

(table 2 continued)

Number	Activities	Responsible
2.	*Insecticide treatment*	
2.1	Provision of insecticide (ARC to write request letter)	CNM, PHD
2.2	Organization of treatment stations linked to HC outreach	OD, ARC/CRC
2.3	Community mobilization to bring mosquito nets for treatment	ARC/CRC
2.4	Develop insecticide-treated sling for children removed from under the net at night	PSI
2.5	Pre-test and pilot insecticide-treated sling in 10 villages to demonstrate impact; explore potential for scale-up following results of pilot	ARC/CRC
3.	*Mosquito nets*	
3.1	Procurement of nets	PHD/OD, ARC/CRC
3.2	Free/heavily subsidized distribution to pregnant women via HCs	OD
3.3	Criteria development for free/heavily subsidized distribution to high risk poorest of the poor in the community	OD, ARC/CRC
3.4	Free/heavily subsidized community distribution	VHSG, CRC volunteers
3.5	Social marketing of subsidized nets	ARC/CRC, PSI
3.6	Monitoring for correct use	all
4.	*Increase drug availability and access*	
4.1	Ensure drug supply in the HCs	PHD, OD
4.2	Increase *Malarine* distributors in the community	PSI
4.3	Follow-up monitoring	OD to coordinate
4.4	Reduce inappropriate drug supply from community vendors	government authorities

Following-up on the joint action plan, CRC volunteer groups in all 254 participating villages of Angkor Chum Operational Health district were trained in malaria transmission, prevention, and early identification and referral from January through March, 2006. In turn, each CRC volunteer completed approximately 20 home visits to motivate improved health practices among all caretakers in their respective communities. Interpersonal communication with each household was undertaken prior to the insecticide treatment campaign. As detailed in the joint action plan (above), activities 2.1, 2.2, and 2.3 relate to insecticide treatment of existing mosquito nets.[5]

[5] Due to staffing issues, the activity was not linked to health center outreach as originally planned.

III. Activities

Training
ICH project staff were initially trained on malaria control, including an overview of insecticide treatment, from December 26-27, 2005. A follow-up training, focusing on communication skills related to malaria control messaging, was conducted on February 3, 2006. A one-day training focusing exclusively on insecticide treatment was jointly planned and organized by the PHD malaria technical expert, the CRC ICH interim project manager, and the AmCross ICH technical training officer. The training was conducted on March 10, 2006 at the Angkor Chum Operational Health District office. The training was interactive with practice sessions to ensure participants mastered the skills needed to undertake insecticide treatment activities in the targeted villages. The training also included preliminary logistics planning for the campaign.

Planning & Logistics
The Provincial Health Department malaria expert prioritized five (5) malaria vulnerable villages in Angkor Chum and Varin districts. CRC ICH field officers visited each priority village. Working with village leaders and CRC volunteers in each of the target villages, a campaign schedule was developed; village leaders and CRC volunteers announced the treatment activity throughout their respective villages.

Additionally, a mosquito net census was conducted in the target villages from June 1-2. Nets were counted and classified according to condition (new/old) and size (small/medium/large). A total of 791 mosquito nets were counted. Annex 3 details the mosquito net census results by village. A summary table is shown below.

Table 3. Summary of mosquito net census and total nets treated by village

No.	Village	Commune	Families	Family member		Number of Children		Total Net Census	Total Nets Treated
				Total	Female	<2 years old	2-5 years old		
1	Teuk Thla	Srae Khvav	96	476	236	4	53	96	83
2	Rolum	Srae Khvav	191	951	497	56	300	186	128
3	Reach Chontol	Srae Khvav	131	755	410	36	97	60	75
4	Kab Dai	Prasath	171	959	472	48	60	320	268
5	Ou	Svay Sar	97	542	273	37	50	129	106
Totals			**686**	**3683**	**1888**	**181**	**560**	**791**	**660**

A final coordination meeting was conducted on the afternoon of June 4 at the ICH project office in Angkor Chum. Fifteen (15) staff from the Cambodian Red Cross (7), health centers (2), OD (1), and the American Red Cross (5) was divided into two field teams. Target villages were grouped by geographic proximity and assigned to the teams. The field team lists and assigned villages are detailed in Annex 4. Teams were deployed on the afternoon of June 4, and stayed overnight in the villages on June 4 and 5. This was done to facilitate work in the villages during early morning and late afternoon as many villagers were working all day in the field transplanting rice.

A central location in each target village, usually where health center outreach sessions occur, was used to set up the insecticide treatment station. Before beginning insecticide treatment in the village, each team reviewed appropriate mosquito net care and use with beneficiaries. Mosquito net washing following treatment was discouraged. Typically, each treatment station was running from 2 to 3 hours as many people came late. No villagers were turned away. The teams waited for approximately 20 minutes after the last treatment before packing up and moving on to the next site.

Insecticide Treatment

The National Malaria Center, through the Provincial Health Department and the Operational Health District, donated six (6) bottles of liquid ICON® 2.5 CS, synthetic parathyroid lambda-cyhalothrin insecticide (300 milliliters/bottle); and, 15 bottles of liquid K-Otrine®, deltamethrin insecticide (1 liter bottles), were procured with project funds from Caritas International in Siem Reap to use for the campaign.

IV. Results

Beneficiaries
The mosquito net census counted a total of 791 nets in the five (5) target villages. The total number of nets treated was 660, or 83 percent of the total number of nets counted during the census. Some villages reported lower than expected turn out on the campaign day due to villagers visiting or working outside of the village.

Assuming that 2.3 people sleep under one mosquito net[6], the treatment of 660 nets is expected to protect 1,518 people. The protective effect of insecticide treatment lasts for a minimum of six months following treatment. Therefore, the total people-years of protection achieved as a result of the campaign is 759 people protected for one year. Assuming (conservatively) that half of the people sleeping under these nets will be children under five years of age yields the equivalent of 380 children under the age of five protected for one-year. As 1,000 mosquito nets are expected to save 5.5 lives over a one-year period[7], protecting 380 children can be expected to save two lives. Additionally, malaria morbidity, and its associated economic burden, can be expected to significantly reduce in the target villages.

Villagers who came to the treatment station with mosquito nets (participating beneficiaries) were asked their names and number of nets they brought for treatment. Three-hundred and eighty (380) individuals brought mosquito nets for treatment, yielding the average number of mosquito nets brought for treatment per participating beneficiary to be 1.74. It is known that many participating beneficiaries also brought their neighbors' nets for treatment (e.g. non-participating beneficiary nets); however, the total number of households which had a net treated was not recorded during the campaign. It is recognized that many households have more than one mosquito net and some households have none.

According to the *Report of the Cambodia National Malaria Baseline 2004*, "sufficient" is defined as 2.3 people per mosquito net. "Within Southeast Asia, a commonly used index of coverage is the number of people divided by the number of nets (i.e. the people: net ratio). It is also a convention, within Cambodia, and we believe also regionally, to use 'less than 2.3 people per net' as the standard for this index, in order to define programmed targets and to estimate procurement needs."

However, interpretation of the net ratio should be made with caution. According to the same *Report of the Cambodia National Baseline Survey, 2004*, "setting a required standard of 1 net for every 2.3 people may be excessively demanding." "The survey data suggest that this is NOT an appropriate cut-off for “sufficient” in this setting, i.e. it is excessively rigorous." And, "that very high levels of net use occur [among children under 5] even with people: net ratios of >1.20." The report further states that, "The overall person: net ratio in the survey population was 2.6, and this was sufficient to give a usage rate in under-five children of almost 90%."

Table 4 below details coverage achievement by population and households.

[6] The *Report of the Malaria National Baseline Survey 2004* defines 'sufficient' as one net for 2.3 people; therefore, 2.3 has been used to calculate the average number of people sleeping under one net.
[7] Lengeler C. Issue 2, 2004 *Insecticide treated bednets and curtains for preventing malaria*

Table 4. Coverage Achievement

No.	Village	Population Census	Target nets to achieve "sufficient"	Total Nets Treated	Percentage of Target reached	Treated Net Ratio	Households	Total Nets Treated	Ratio of nets treated to households
1	Teuk Thia	476	207	83	40.1	5.7	95	83	0.9
2	Rolum	951	413	128	31.0	7.4	190	128	0.7
3	R. Chontol	755	328	75	22.8	10.1	151	75	0.5
4	Kab Dai	959	417	268	64.3	3.6	192	268	1.4
5	Ou	542	236	106	45.0	5.1	108	106	1.0
Totals		**3683**	**1601**	**660**	**41.2**	**5.6**	**737**	**660**	**0.9**

In reference to Table 4 above, *target nets to achieve "sufficient" coverage* was calculated by dividing the village populations by 2.3. *Percentage of target reached* was calculated by dividing *target nets to achieve coverage* by *total nets treated*. The *treated net ratio* average is 5.6 with a range of 3.6 to 10.1.

Although household coverage data was not collected as part of the campaign (see above), the number of treated nets divided by the total number of households reveals the ratio of treated nets to households, averaging 0.9 with a range of 0.5 to 1.4. In other words for every household in the five villages there are 0.9 treated nets as a result of the campaign. Assuming one net per household, it can be estimated that 90 percent of all households are protected with an insecticide treated net.

Overall, this data suggests that the campaign achieved coverage rates in excess of the 60-70 percent needed to achieve the community-wide effect[8,9] in four of the villages. The community-wide effect is an overall reduction in malaria transmission for both net users and non-users, which has been proven to result from high levels of insecticide treated bed nets within a community. Thus, it is likely that all 2,928 villagers from these four villages will directly or indirectly benefit from the treatment activity as a result of the community-wide effect. Therefore, the total number of unduplicated, direct and indirect beneficiaries is 3,101. This is calculated by adding the total populations of the four villages achieving coverage rates in excess of 70 percent and the total direct beneficiaries for R. Chontol (total treated nets multiplied by 2.3 equals 173 direct beneficiaries).

Cost-Effectiveness

The total cost of training and both field activities is $2,506.80. This includes $424.15 in training costs, $1,167.95 in Phase I field costs, and $914.70 in Phase II field costs. Itemized costs are summarized in Table 5 below.

[8] Maxwell CA et al. (December 2002) *Effect of community-wide use of insecticide-treated nets for 3-4 years on malarial morbidity in Tanzania*, Journal of Tropical Medicine and International Health, Volume 7 No 12, pp. 1003-1008

[9] Hawley WA et al. (2003) *Community-wide effects of permethrin-treated bednets on child mortality and malaria morbidity in western Kenya*, American Journal of Tropical Medicine and Hygiene, 68 (Supp. 4), pp. 121-127

Table 5. Costs

No.	Description	Training	Phase I	Phase II	Total
1	Per diems/accommodation-MOH staf	209.5	209.00	96.00	305.00
2	Per diems/accommodation-ICH staff	80	96.50	118.00	214.50
3	Fuel (estimated)	10	91.00	60.00	151.00
4	Supplies	124.65	51.45	10.7	62.15
6	Insecticide		720.00	630.00	1350.00
	TOTAL	**424.15**	**1167.95**	**914.70**	**2506.80**

Table 6 below shows costs per net, direct beneficiary, and life saved by training, Phase I and Phase II activities. Cost per net was calculated using the total cost divided by total number of nets treated; cost per direct beneficiary was calculated by taking the total cost divided by total direct beneficiaries; cost per life saved was calculated by taking the total cost divided by the estimated number of lives saved.

The cost of Phase II field activities was double that of Phase I activities. This has two explanations. First, ICON insecticide yielded a per net cost $0.42 during phase I. Phase II used a combination of ICON and K-Otrine with a cost per net of $0.95 (not shown). Second, Phase I per diem payments averaged $25.46 per village; Phase II per diem payments averaged $42.80 per village (not shown). Although the team size (15 personnel) and campaign days (2) remained the same for both Phase I and Phase II, the number of villages targeted decreased from 12 villages in Phase I to five (5) villages in Phase II.

Table 6. Cost-Effectiveness

No.	Unit Costs in USD	Training	Phase I	Phase II	Total
1	Per net	0.18	0.69	1.39	1.06
2	Per direct beneficiary	0.08	0.30	0.60	0.46
3	Per life saved	60.59	233.59	457.35	358.11

Combining costs for both activities reveals an average cost per net treated to be $1.06, or $0.46 per direct beneficiary. By comparison, long-lasting insecticide treated bed nets cost less than $5.00 per net, and have an expected repellent life of 4-5 years. The cost of maintaining one bed net with insecticide treatment over a four-year time period (using a campaign strategy) would cost an equivalent of $8.48. This figure excludes the cost of the bed net. Therefore, it is more cost effective to provide new long-lasting insecticide treated bed nets than continue retreatment campaigns.

The average cost per life saved as a result of both campaigns is $358.11.

Annex 1. Mosquito net census and campaign treatment result by village

Village	Nº of families in village	Family members		Families have nets	Number of Nets Census								Total nets Census	Nets Treated Campaign Results
					New nets				Old nets					
		Total	Female		Small	Medium	Large	Total	Small	Medium	Large	Total		
Teuk Thla	96	476	236	67	0	0	1	1	15	5	75	95	96	83
Rolum	191	951	497	144	3	1	4	8	36	14	128	178	186	128
R. Chontol	131	755	410	52	0	0	0	0	4	5	51	60	60	75
Kab Dai	171	959	472	156	2	39	7	48	27	208	37	272	320	268
Ou	97	542	273	80	17	23	5	45	13	50	21	84	129	106
Total	**686**	**3683**	**1888**	**499**	22	63	17	**102**	95	282	312	**689**	**791**	**660**

Annex 2. Field teams lists

Group I

Nº	Name	Organization	Location from	Target Village	Commune
1	Suong Sar	CRC, FO	Varin		
2	Phoeun Chhy	CRC, FO	Angkor Chum		
3	Roth Romnea	CRC, APM	Angkor Chum		
4	PHD	Absent	Siem Reap		
5	Pen Monorum	ARC,TOT	Angkor Chum	1-Rolum	Srae Khvav
6	Chhun Sona	ARC, M&E	Angkor Chum	2-Teuk Thla	Srae Khvav
7	Phon Navuth	ARC, Driver	Phnom Penh	3-Reach Chantol	Srae Khvav
8	Kao Mok (HC Svay Sar	HC Staff	Svay Sar		
9	Village Leader	Community	Rolum		
10	Village Leader	Community	Teuk Thla		
11	Village Leader	Community	Reach Chantol		
12	Volunteer Leader	Community	Rolum		
13	Volunteer Leader	Community	Teuk Thla		
13	Volunteer Leader	Community	Reach Chantol		

Group II

Nº	Name	Organization	Location from	Target Village	Commune
1	Uon Eath	CRC, FO	Varin		
2	Ean Kang	CRC, FO	Varin		
3	Eung Phaly	CRC, FO	Angkor Chum		
4	Sor Sara	ARC, PC	Angkor Chum		
5	Kroch Samoeun	OD Staff	Puok	1-Kap Dai	Prasath
6	Nop Chansery	CRC, A/F	Angkor Chum	2-Ou	Svay Sar
7	Hel Kim Morn	ARC, Driver	Angkor Chum	3-Reach Chantol	Srae Khvav
8	Nop Vanny	HC Staff	Angkor Chum		
9	Village Leader	Community	Kap Dai		
11	Village Leader	Community	Ou		
12	Volunteer Leader	Community	Kap Dai		
13	Volunteer Leader	Community	Ou		

Annex 3. Insecticide treatment campaign result by village

Insecticide treatment campaign result on June 5-6, 2006

Nº	Village	Commune	Family nets treated	Pregnant nets treated	Nets treated by villages						Total nets treated
					New nets			Old nets			
					Small	Medium	Big	Small	Medium	Big	
1	Teuk Thla	Srae Khvav	53	3	21	1	56	2	0	3	83
2	Rolum	Srae Khvav	96	12	47	1	80	0	0	0	128
3	R.Chontol	Srae Khvav	48	1	21	0	51	1	0	2	75
4	Kab Dai	Prasat	123	9	59	82	83	17	10	17	268
5	Ou	Svay Sar	60	1	30	26	39	0	5	6	106
	Total:		**380**	**26**	**178**	**110**	**309**	**20**	**15**	**28**	**660**

Integrated Child Health Project

Activity and Evaluation Report III

Diarrhea Control & Diarrhea Treatment Kits

FY-2004 Child Survival and Health Grants Program (CSHGP)
Grant No. GHS-A-00-04-00007-00

Siem Reap, Cambodia
October, 2006

CAMBODIAN RED CROSS

American Red Cross

USAID
FROM THE AMERICAN PEOPLE

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I. Summary

The Cambodian Red Cross is implementing an Integrated Child Health (ICH) Project in Angkor Chum Operational Health District of Siem Reap Province, Cambodia. The American Red Cross and the United States Agency for International Development (USAID) provide technical and financial support. The goal of the ICH Project is to reduce child morbidity and mortality in a sustainable fashion in Angkor Chum Operational Health District. Diarrhea prevention and control is critical to achieve Strategic Objective 3: improved management of the sick child.

The ICH Project uses a comprehensive, community-based approach to prevent and control diarrhea. Through an extensive network of nearly 2,000 Red Cross volunteers, the ICH Project promotes improved health practices related to hygiene, handwashing, recognition of diarrhea danger signs, case reporting, treatment, and referral for severe cases. The Diarrhea Treatment Kit (DTK) or *Orasel*® is promoted as a home care option as part of the overall ICH Project diarrhea prevention and control strategy.

This report covers all diarrhea prevention and control activities with a focus on *Orasel*® Diarrhea Treatment Kit (DTK) promotion and selling. These activities began in earnest in April, 2006. Since that time, Red Cross volunteers completed 28,992 home visits to promote illness recognition and danger signs, hygiene and handwashing, as well as home care, including the promotion of *Orasel*® and Oralit. Home visits were complemented with seven hygiene edutainment sessions with a total of 890 participants. Initially, twenty villages were targeted for *Orasel*® promotion and selling (DTK villages). An additional 20 villages were added in September. Four-hundred thirty-four (434) *Orasel*® Diarrhea Treatment Kits were sold from May through September in these villages.

Challenges to implementation included the onset of rainy/rice planting season coinciding with the introduction of *Orasel*®, uncertainty about product re-supply, as well as a lecture style approach to volunteer training.

Despite these limitations, a two-stage, random cluster survey revealed *Orasel*® brand recognition by 68 percent of mothers in DTK villages as compared to 26 percent in non-DTK villages. Recognition of zinc was lower: only 34 percent of mothers in DTK villages recognized zinc as compared to 13 percent in non-DTK villages.

Related to use of oral re-hydration salts (ORS includes both *Orasel*® and Oralit), 72 percent of mothers in DTK villages reported using ORS during their child's last diarrhea episode. Only 56 percent of mothers in non-DTK villages reported this practice. However, at the baseline (March, 2005) only 33 percent of mothers reported giving ORS during their child's last diarrhea episode. A representative sample of the same geograph area shows that this rate has increase by 24 percent: 57 percent of mothers now report ORS use.

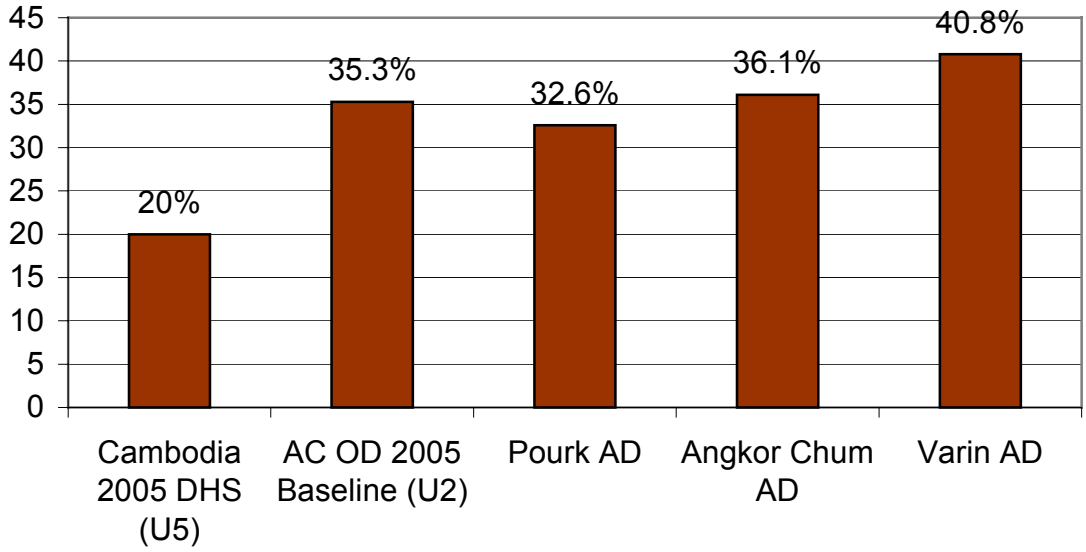
Also of interest is the increase from 41 percent (baseline) to 68 percent (survey) for mothers reporting to give more breast milk during their child's last diarrhea episode. Mothers reporting increased fluid and food intake also went up, by 16 percent and 41 percent respectfully. However, food intake following the last episode of diarrhea decreased (insignificantly) by 9 percent.

II. Background

Diarrhea is estimated to account for 25 percent of all childhood death in Cambodia.[1] Diarrhea causes dehydration, which can quickly lead to death if not properly managed. Oral re-hydration therapy (ORT) has proven to be highly effective to prevent and treat dehydration. It is estimated that 15 percent of all diarrhea associated childhood death could be averted if ORT was used during each diarrhea episode. Furthermore, zinc has now been proven to reduce both the duration and severity of diarrhea episodes as well as reduce reoccurrence for several months following use.[2] Approximately nine percent of diarrhea associated childhood death could be averted by treatment with zinc.[3]

The Cambodian Red Cross, with technical and financial support from the American Red Cross, is implementing an Integrated Child Health (ICH) Project in Angkor Chum Operational Health District of Siem Reap Province, Cambodia. The ICH Project is supported by the American people through the United States Agency for International Development (USAID) Child Survival and Health Grants Program. The goal of the ICH Project is to reduce child morbidity and mortality in a sustainable fashion in Angkor Chum Operational Health District of Siem Reap province, Cambodia.

Graph 1. Two-week diarrhea prevalence by OD and administrative district



Graph 1, above, shows two-week diarrhea prevalence at the national level, Angkor Chum Operation District (OD), and the three administrative districts (AD) that comprise Angkor Chum OD. Diarrhea prevalence increases from each AD from south to north and progressively further from the national highway.

[1] Millennium Development Goal 4: Reducing Child Mortality in Cambodia, Child Survival Partnership High Level Consultation, Phnom Penh May 31-June 2, 2004
[2] UNICEF, Clinical Management of Acute Diarrhea, WHO/UNICEF Joint Statement, May 2004
[3] Jones G et al. How many child deaths can we prevent this year?, *Lancet* 2003; 362: 65-71

The ICH Project uses a comprehensive, community-based approach for diarrhea prevention and control. Through an extensive network of nearly 2,000 Red Cross volunteers, the ICH Project promotes improved health practices related to hygiene, handwashing, recognition of diarrhea danger signs, case reporting, treatment, and referral for severe cases. The *Orasel*® Diarrhea Treatment Kit (DTK) is promoted as a home care option as part of the overall ICH Project diarrhea prevention and control strategy.

DTK is sold using a social marketing scheme developed by PSI/Cambodia. DTK bundles 2 packs of low osmolarity ORS with 10 tablets of 20 mg. dispersible zinc and a consumer insert containing information on correct use, danger signs, prevention, and messages on continued feeding. The DTK offers a "1-2 punch": rehydration and reduction of severity. DTK is sold in the villages with the intent of making DTK more available then antibiotics and anti-diarrheals.

Zinc is a new product in Cambodia. The concept of water-soluble tablets is not common, especially in the rural areas. Additionally, the treatment recommendation (one tablet dissolved in water for children 6 months to 5 years of age for 10 consecutive days even if diarrhea episode has stopped[4]) is not consistent with the treatment recommendation for ORS (continuous until diarrhea episode has stopped). These issues complicate communication for correct and concomitant use of both products. PSI/Cambodia has undertaken formative research in Siem Reap to make the packaging and insert easily understandable with minimum text.

DTK was launched with a comprehensive communication strategy including radio and television broadcasts, mobilization activities through mobile video units, training of shopkeepers (via RACHA), and training of Red Cross volunteers. Additionally, PSI has provided promotional items, tee-shirts, caps, water bottles, banners, baby wear, etc., to increase recognition of the brand name *Orasel*®.

[4] ZinCfant 20mg information sheet, www.nutriset.fr, last update 11/2004

III. Activity Overview

This report includes the results of diarrhea prevention and control activities, including the piloting of DTK. These activities began in earnest in April. Prior to that time, a letter of understanding was signed among Population Services International (PSI), the Cambodian Red Cross (CRC), and the American Red Cross (AmCross). ICH Project staff were trained as trainers in diarrhea prevention and control, including oral re-hydration therapy. Colorful didactic materials, emphasizing key diarrhea control messages, were designed as job aids to be used by Red Cross volunteers (see Annex B). This training was planned and conducted with technical staff from the Provincial Health Department (PHD) and Operational District (OD).

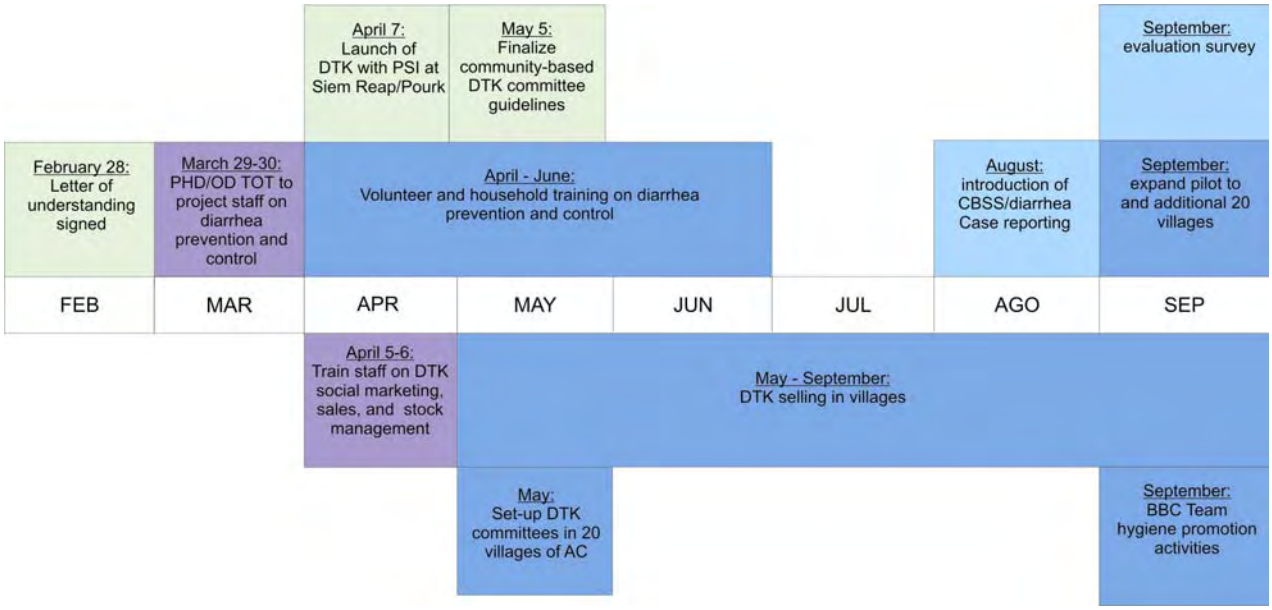
From April through June, field officers trained nearly 2,000 Red Cross volunteers, covering 254 villages of Angkor Chum OD. Red Cross volunteers are responsible for completing homevisits to negotiate improved health practices with all households with children under five and/or women of reproductive age. Each volunteer is assigned to approximately 20 households in their own village.

In May, community-based DTK committee guidelines were drafted and finalized; these were used to set-up DTK committees in 20 pilot villages of Angkor Chum. DTK sales have been ongoing since that time. Selected staff were trained by PSI in DTK social marketing, sales, and stock management. Those staff, in turned, trained the village-based DTK committees responsible for selling *Orasel* in their village.

In August, the community-based surveillance system (CBSS) was pilot tested. The CBSS records diarrhea cases as well as ORS use in addition to other health statistics by RC volunteers.

In September, the behavior change communication team launched village-based hygiene promotion activities. Twenty (20) additional villages were added to the pilot in September as well. A field visit with Secretary of State for Health, High Excellency Prof. Eng Hout and National Child Survival Chairman, Dr. Hong Rathmony with PSI and RACHA was completed on September 15. An evaluation survey was conducted on diarrhea control and DTK at the end of September. Survey results are included in this activity report.

Illustration 1. Diarrhea control and DTK timeline

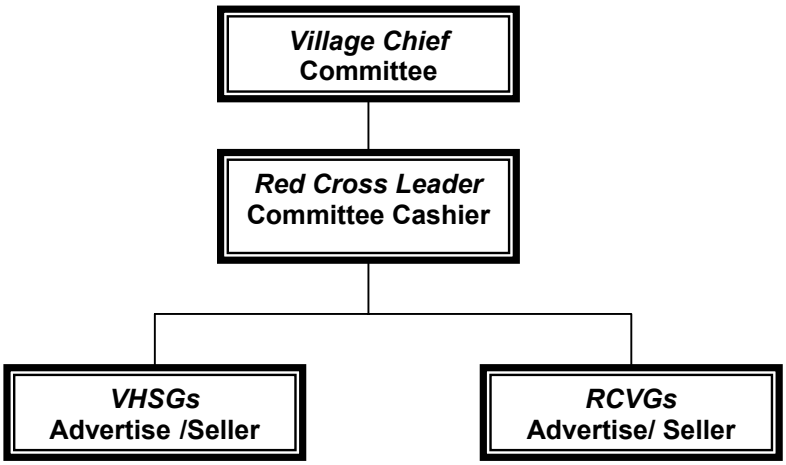


IV. Design

Initially, twenty (20) villages were selected to pilot DTK selling. The village number was limited to ensure sufficient product supply to satisfy demand. Pilot villages were selected based on perceived need (less well off) and geograph dispersion within Angkor Chum AD. In September, an additional 20 villages in Angkor Chum were added to the pilot.

Within each target village, ICH Project field officers facilitated the formation of a committee. Each committee consists of the village leader, RC volunteer leader (RCVL), RC volunteers, and a Village Health Support Group (VHSG) member. The field officers facilitated this process. The village leader is the committee chairman and oversees all activity; the RCVL is responsible for managing stock, cash transactions, issuing receipts, and safekeeping sales revenue. Cash is kept in a locked box provided by the project. The VHSG and RC volunteers are responsible for promoting the product among the households they work with and bringing potential customers to the RCVL leader to purchase DTK.

Illustration 2. Community DTK Committee Structure



DTK is sold for 1,500 Cambodian Riel; three hundred (300) riel are given to the person who brings the customer to the RCVL to purchase DTK as an incentive. The balance of 1,200 riel is kept in the locked box. This money can be used by the Red Cross volunteer groups to pay transportation costs to the health center for severe diarrhea cases or other illnesses.

Presently, there are 40 pilot villages, with 378 committee members in all seven communes of Angkor Chum AD.

V. Results

The ICH Project's monitoring and evaluation (M&E) system collects routine activity data to track project outputs. The system also collects outcome and impact data through periodic surveys in order to verify progress towards achievement of the project objectives. This is done by comparison of data with baseline levels.

A. Routine Activity Reporting

Diarrhea prevention and control activities shown below include: (1) the number of home visits completed by Red Cross volunteers with a focus on diarrhea control, including DTK promotion[5], throughout 254 villages; (2) the number of community-based hygiene activities completed by the Behavior Change Communication team; and, (3) the number of DTK units sold in the pilot villages. Data presented in this section of the report was collected through routine reporting systems and are actual counts.

The total number of home visits related to diarrhea prevention and control between April and September, 2006 was 28,992. Topics covered were illness recognition and danger signs, diarrhea prevention (hygiene and handwashing), and home care (including promotion of *Orasel*® and Oralit).

The Behavior Change Communication (BCC) team launched community-based hygiene and *Orasel*® promotion activities in September. These edutainment sessions promote key diarrhea prevention and treatment messages using dynamic and interactive approaches to encourage improved practices. Table 1 below summarizes community participation during these sessions.

Table 1. Behavior Change Communication team community-based hygiene promotion activity

No.	**Target Area**		**Number of participants**						
	Village	District	6-14 Y	Adult	RCVL	RCV	Parents	VL	**TOTAL**
1	Being	A/C	108	0	1	6	4	1	120
2	Bott	A/C	106	0	0	1	13	1	121
3	Romduol Thmeiy	A/C	50	0	0	0	3	0	53
4	Don Peng	A/C	117	6	1	6	31	1	162
5	Prolit	A/C	146	0	1	2	2	0	151
6	Trapeang Resseiy	Pourk	131	10	1	10	25	1	178
7	Reul	Pourk	89	4	2	1	8	1	105
TOTALS			*747*	*20*	*6*	*26*	*86*	*5*	*890*

Table 2. DTK sales by month in pilot villages

Month	**DKT units sold**	**Notes**
May	83	DTK selling committees are set-up, trained, and sales begin
June	122	Increased sales attributed to promotion and satisfaction with use
July	44	Decreased sales attributed to mothers working in the field
August	59	Decreased sales attributed to mothers working in the field
September	126	Increased sales attributed to launching of community hygiene activities and expansion to additional 20 villages
TOTAL	**434**	

[5] Although DTK selling was undertaken as a project activity for only 20 villages until September, DTK was promoted by Red Cross volunteers in all 254 villages to support the DTK selling through shopkeepers organized by PSI and RACHA.

Table 2 above summarizes DTK sales by month in the pilot villages. A total of 434 DTK units were sold from May through September, 2006. A detailed record of sales by village and month is included as Annex A to this report. The decrease in sales from June to July is primarily attributed to the onset of the rainy season, which is when villagers transplant rice to the field, and are likely to have less time to care for simple diarrhea cases properly.

B. Evaluation Survey Methodology

Data presented in this section was collected through a two-stage cluster sample survey undertaken from September 28-30. The survey was planned, organized, and supervised by the ICH M&E officer and forms part of the ICH Project's M&E system. Five OD staff completed interviews with the mothers. A half-day training session took place on the afternoon of September 27 to review the survey instrument and complete logistics planning with the survey team.

The original survey design included a random sample of 15 villages in Pourk and Angkor Chum ADs. An additional 10 villages were randomly selected from the pool of 20 DTK selling villages. Varin District was excluded from the sample due to severe road conditions resulting from the rainy season. Access to any village randomly selected in Varin could not be guaranteed at the time of the survey. Within each selected village, the interviewers randomly selected five mothers with children under two years of age.

An additional two villages were added due to difficulty in locating sufficient mothers with children under two years of age at the time the interview team visited the village. In each case, the nearest village was added. A total of 125 mothers with children under two years of age were interviewed in 17 villages of Angkor Chum and Pourk Districts.

C. Data Analysis

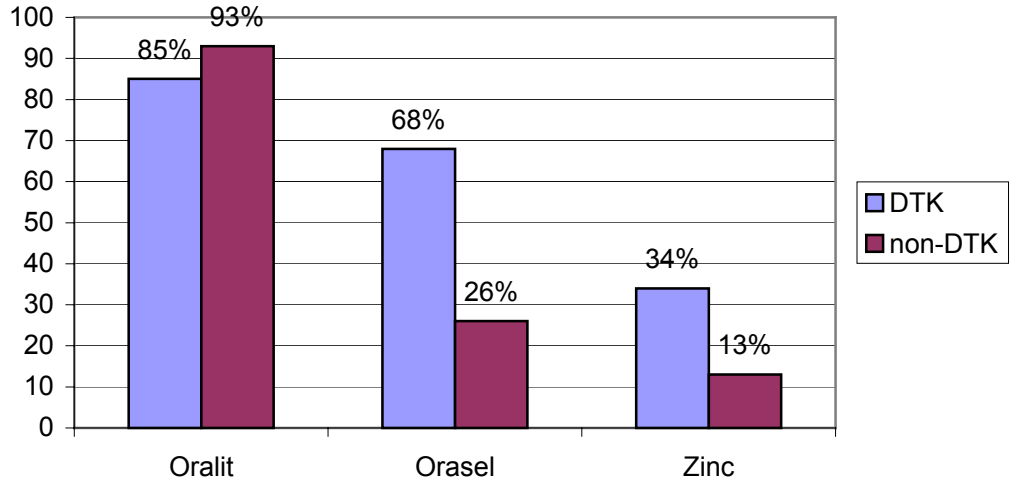
Data was entered into Excel to calculate simple proportions. Data was analyzed by: (1) comparison between DTK villages and non-DTK villages. For this comparison, the data was separated into DTK villages and non-DTK villages; (2) the original sample of 15 villages was reconstructed in order to achieve representative data for both ADs. This was done in the interest of comparing statistics with baseline data collected in March, 2005. Baseline data used in this report also excludes data collected from Varin District.

One small difference between the baseline and diarrhea evaluation survey, is that the baseline survey only asked about actions before and during diarrhea to mothers reporting their child had had diarrhea in the previous two weeks. Due to the limited sample size for the diarrhea evaluation, these behavior questions were asked about the last child diarrhea episode <u>whenever</u> that may have occurred.

1. DTK villages versus non-DTK villages

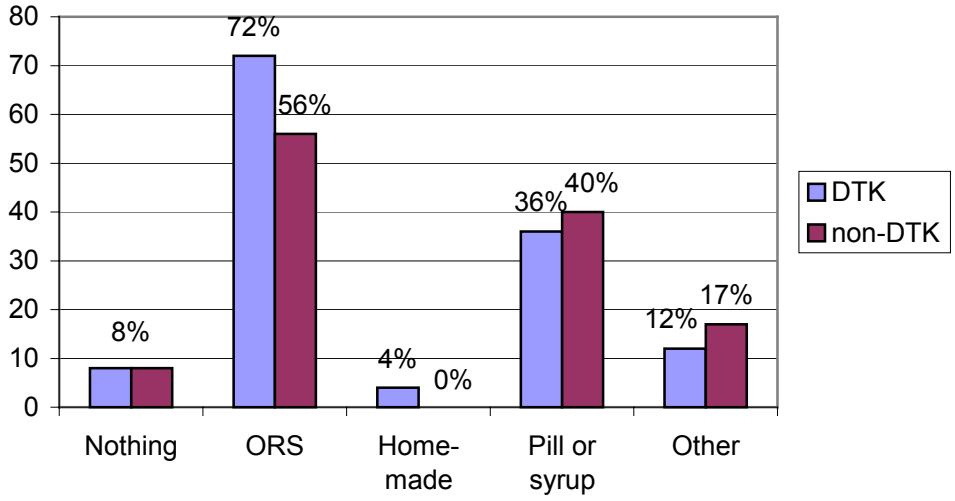
Mothers were asked if they had ever heard of Oralit, *Orasel*®, and/or zinc. Recognition of Oralit was similar between DTK and non-DTK villages; 85 percent and 93 percent. Recognition of *Orasel*® the DTK brand name, was significantly higher in DTK villages: 68 percent of mothers in those villages had heard about *Orasel*®, as compared to 26 percent of mothers in non-DTK villages. Similarly, recognition of zinc was 21 percent higher in DTK villages as compared to non-DTK villages.

Graph 2. Recognition of Oralit, *Orasel*®, and zinc



Mothers were asked: "what did you give your child the last time s/he had diarrhea?". With the exception of ORS use, DTK and non-DKT villages are similar. Use of ORS (either *Orasel*® or Oralit) was higher in DTK villages: 72 percent compared to 56 percent. Of concern is the high proportion of mothers, between 36 to 40 percent, who reported giving either a pill or syrup during the last diarrhea episode.

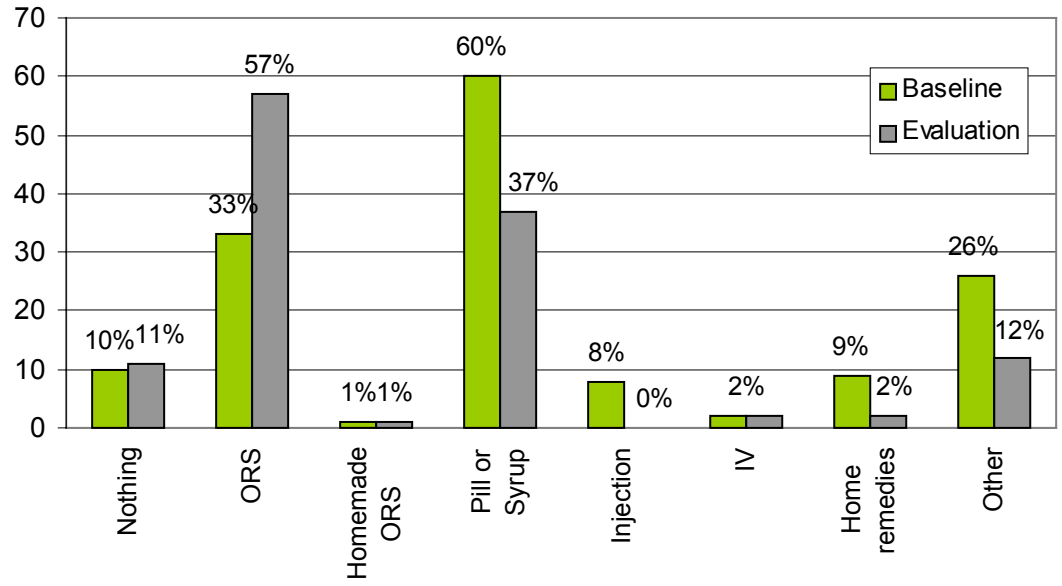
Graph 3. Diarrhea treatment



2. Baseline versus evaluation

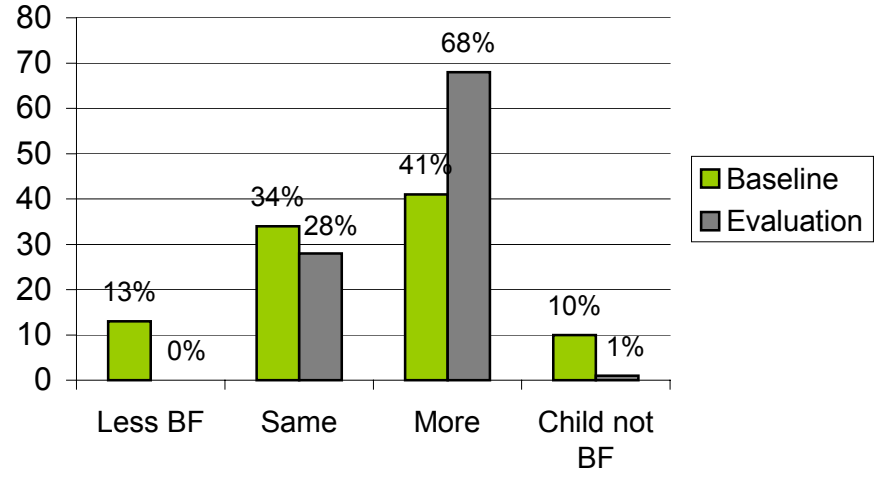
In order to evaluate progress since the baseline survey, mothers were asked "what was given to treat diarrhea during the last episode?" Graph 4 below shows ORS use (including DTK and Oralit) increased from 33 percent to 57 percent. There was a corresponding significant decrease from 60 percent to 37 percent of treating with a pill or syrup. Injection went from eight percent to zero. "Other" treatments also decreased from 26 percent to 12 percent. A secondary analysis revealed no significant differences between DTK and non-DTK villages.

Graph 4. Diarrhea treatment

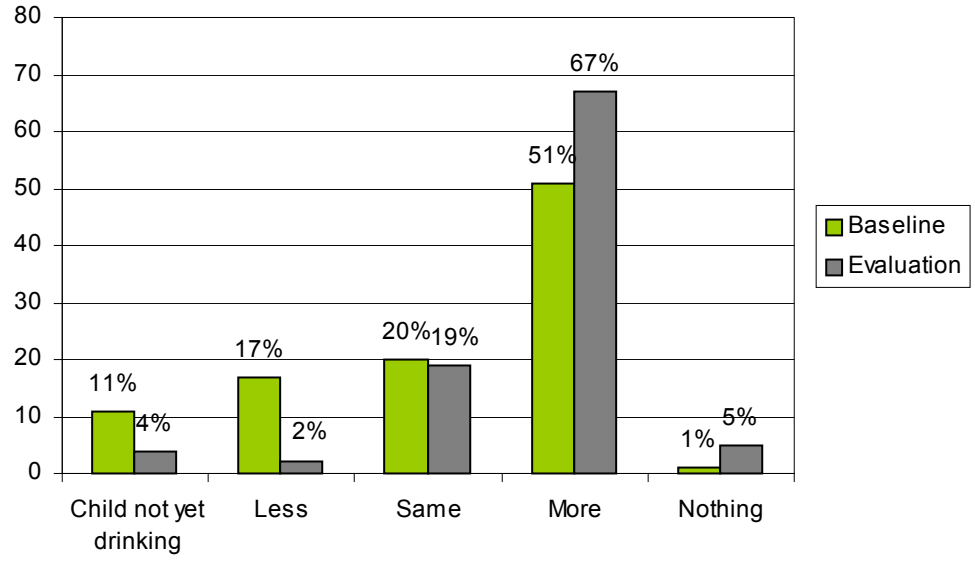


Graph 5 below details mothers' responses to the question "when your child had diarrhea, did you breastfeed him/her less than usual, about the same amount, or more than usual?". In the baseline survey, 13 percent of mothers reported reducing breastfeeding during diarrhea, but by the evaluation survey no mothers reported this practice. Concomitantly, the proportion of mothers reporting increasing breastfeeding during diarrhea increased from 41 percent to 68 percent.

Graph 5. Breastfeeding during last diarrhea episode



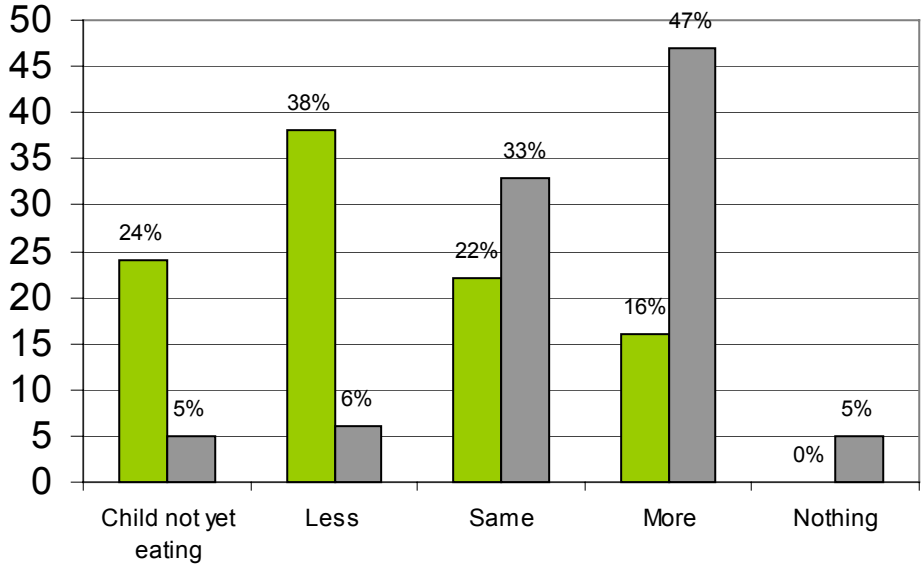
Graph 6. Fluid intake during last diarrhea episode



Graph 6 above details responses to the question "when your child last had diarrhea was he/she offered less than usual to drink, about the same amount, or more than usual to drink?". Similar to breastfeeding, fluid intake during the last diarrhea episode increased: during the baseline survey 51 percent of mothers reported giving more fluids during diarrhea at baseline compared to 67 percent reporting this practice at the time of the evaluation survey.

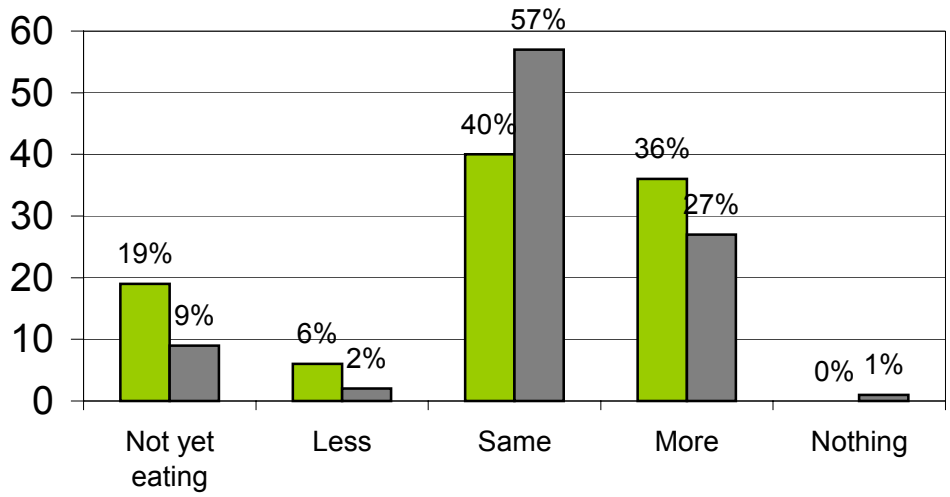
Graph 7 below shows data related to reported food intake of the child during their last episode of diarrhea. Mothers reported a significant reduction in withholding food during the last diarrhea episode: from 38 percent to 6 percent. Similarly, there was a 31 percent increase in mothers reporting giving their sick child more food.

Graph 7. Food intake <u>during</u> last diarrhea episode



However, when mothers were asked about food intake following the last diarrhea episode, the majority (57 percent) reported giving the same amount as usual; an increase of 17 percent over the baseline statistic. Mothers who reported giving more food decreased (insignificantly) by 9 percent; thus highlighting no progress on this indicator.

Graph 8. Food intake <u>following</u> last diarrhea episode



VI. Constraints

Overall, the implementation of the diarrhea prevention and control strategy, including DTK selling has gone smoothly. However, three challenges have limited progress. First, the onset of the rainy season, which is when villagers transplant rice to the field, coincided with the introduction of DTK. Furthermore, access to several villages has been limited due to road conditions exasperated during rainy season. Red Cross volunteer leaders have reported sales to drop off beginning in July as mothers are busy in the field. It is noteworthy that this is an ongoing challenge effecting rural programming.

Second, uncertainty about restocking DTK delayed expansion to additional villages. The second procurement from PSI was only available in early September. As this issue has been resolved, the project has scaled-up to an additional 20 villages.

Third, ICH Project staff use lecture style communication when working with RC volunteer groups. This approach is limiting the potential for effective communication to truly negotiate improved health practices and motivate behavior changes.

VII. Recommendations

The ICH Project should scale-up DTK selling to all 254 villages of Angkor Chum OD. The project has laid the groundwork for expansion of the DTK pilot to all villages. This has been done by including DTK as a recommended care option for simple diarrhea in the IEC materials and this information has been included as part of the village-based volunteer trainings to all CRC volunteers. Additionally, budget resources have been set aside for DTK procurement to scale. However, expansion will depend on product availability. At the time of writing of this report, PSI reported that the DTK pilot has been extended through December 2006.

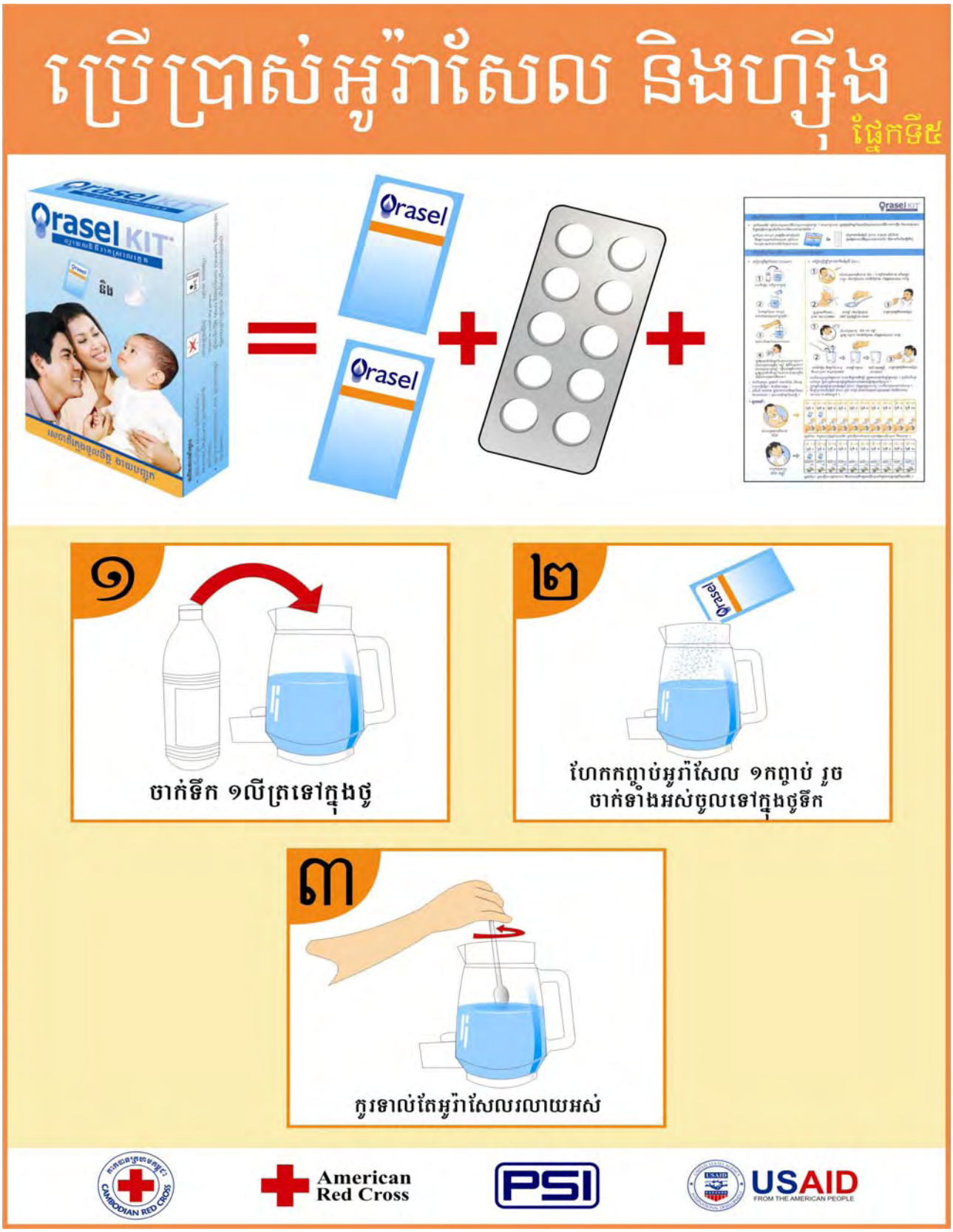
A series of workshops focusing on participatory and empowerment approaches are already underway with ICH Project staff. These workshops focus on strengthening skills and building capacity on interactive adult learning using a behavior change communication approach.

Finally, the ICH Project is intensifying promotion activities in order to further increase diarrhea control and DTK selling. Activities include expansion of BCC team edutainment sessions and refresher trainings to RC volunteer groups focusing using more participatory approaches including DTK practice demonstrations, role-plays, and group discussions.

Annex 1. Sales by village and month

No	Village	May	June	July	Aug	Sep	Total
1	Kouk Kbat	6	4	0	1	2	**13**
2	Chhuk	7	2	0	0	0	**9**
3	Char Roka	4	1	2	1	0	**8**
4	Prey Lvay	4	0	1	2	0	**7**
5	Kouk Thnong	8	5	0	2	0	**15**
6	Khchas	5	0	4	5	2	**16**
7	Bos Lhong	1	3	0	0	0	**4**
8	Ta Saom	2	4	3	3	0	**12**
9	Ka Rolum	1	19	1	0	2	**23**
10	Pnov	3	17	7	7	0	**34**
11	Khvav	5	5	0	7	18	**35**
12	Khan Sar	2	5	6	7	2	**22**
13	Kouk Knang	0	11	4	2	3	**20**
14	Rovieng Thmei	1	10	0	7	2	**20**
15	Rulum	1	2	2	0	0	**5**
16	Prasat Trav	5	1	2	0	0	**8**
17	Kam Bleub	16	13	2	4	0	**35**
18	Doun Em	3	9	4	0	0	**16**
19	Kouk Thmei	0	5	0	7	0	**12**
20	Lbeuk	9	6	6	4	16	**41**
21	Doun Svay	0	0	0	0	1	**1**
22	Kbal Cham	0	0	0	0	7	**7**
23	Klong	0	0	0	0	0	**0**
24	Thmei	0	0	0	0	0	**0**
25	Roka	0	0	0	0	10	**10**
26	Beng	0	0	0	0	10	**10**
27	Doun Peng	0	0	0	0	0	**0**
28	Kouk Yeang	0	0	0	0	6	**6**
29	Thnal	0	0	0	0	24	**24**
30	Kouk Thmei	0	0	0	0	2	**2**
31	Svay Chum	0	0	0	0	0	**0**
32	Tonle Sar	0	0	0	0	14	**14**
33	Srae Khvao	0	0	0	0	1	**1**
34	Srae Prang	0	0	0	0	0	**0**
35	Teuk Thla	0	0	0	0	0	**0**
36	Reach Chantul	0	0	0	0	0	**0**
37	Tum Rab	0	0	0	0	0	**0**
38	An Tit Sokh	0	0	0	0	0	**0**
39	Kouk Snuol	0	0	0	0	0	**0**
40	Nokor Pheas	0	0	0	0	4	**4**
	Total	***83***	***122***	***44***	***59***	***126***	***434***

Annex 2. Didactic materials



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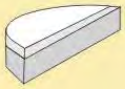

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American Red Cross
USAID

ដំណើរការនៃការលាងសំអាតដៃ

ផ្នែកទី៤

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ដួសទឹកពីពាង

ស្រោចទឹកលាងដៃទាំងពីរ

យកដេះឬសាប៊ូ និងក្បុងមកដុះលាងដៃទាំងពីរ

យកសាប៊ូមកដុះលាងដៃទាំងពីរ

ចាក់ទឹកលាងដៃទាំងពីរម្តងទៀត

យកកន្សែងស្អាតមកជូតដៃទាំងពីរ

ត្រូវលើកបញ្ឆៃដៃទាំងពីរឡើងលើ

យកទឹកទៅក្នុងចានដែកទៅចាក់ចោល

American Red Cross

USAID

ការការពារជំងឺរាគរូសក្នុងគ្រួសារ
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American Red Cross
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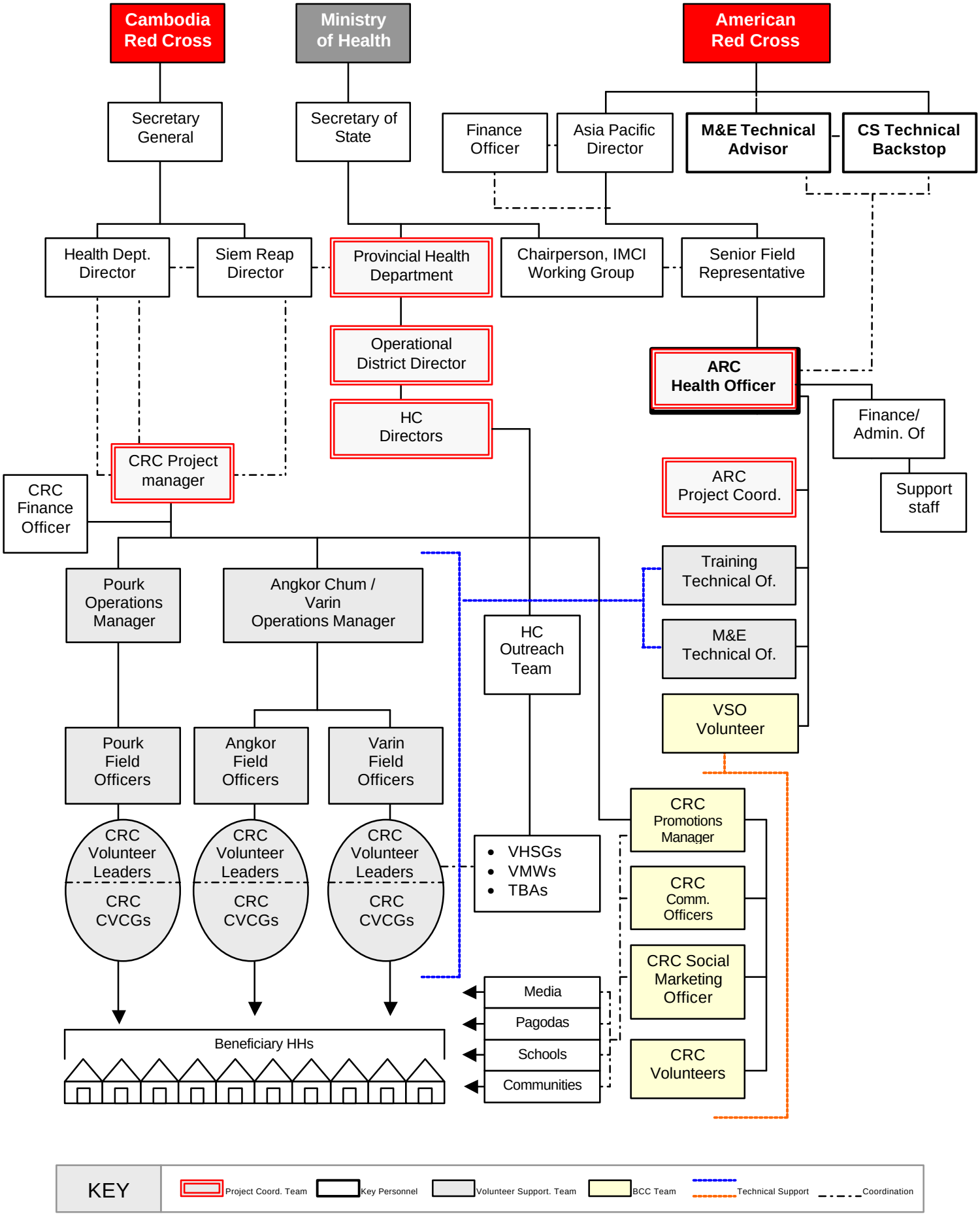
Attachment F6 - Integrated Child Health Project Organizational Chart



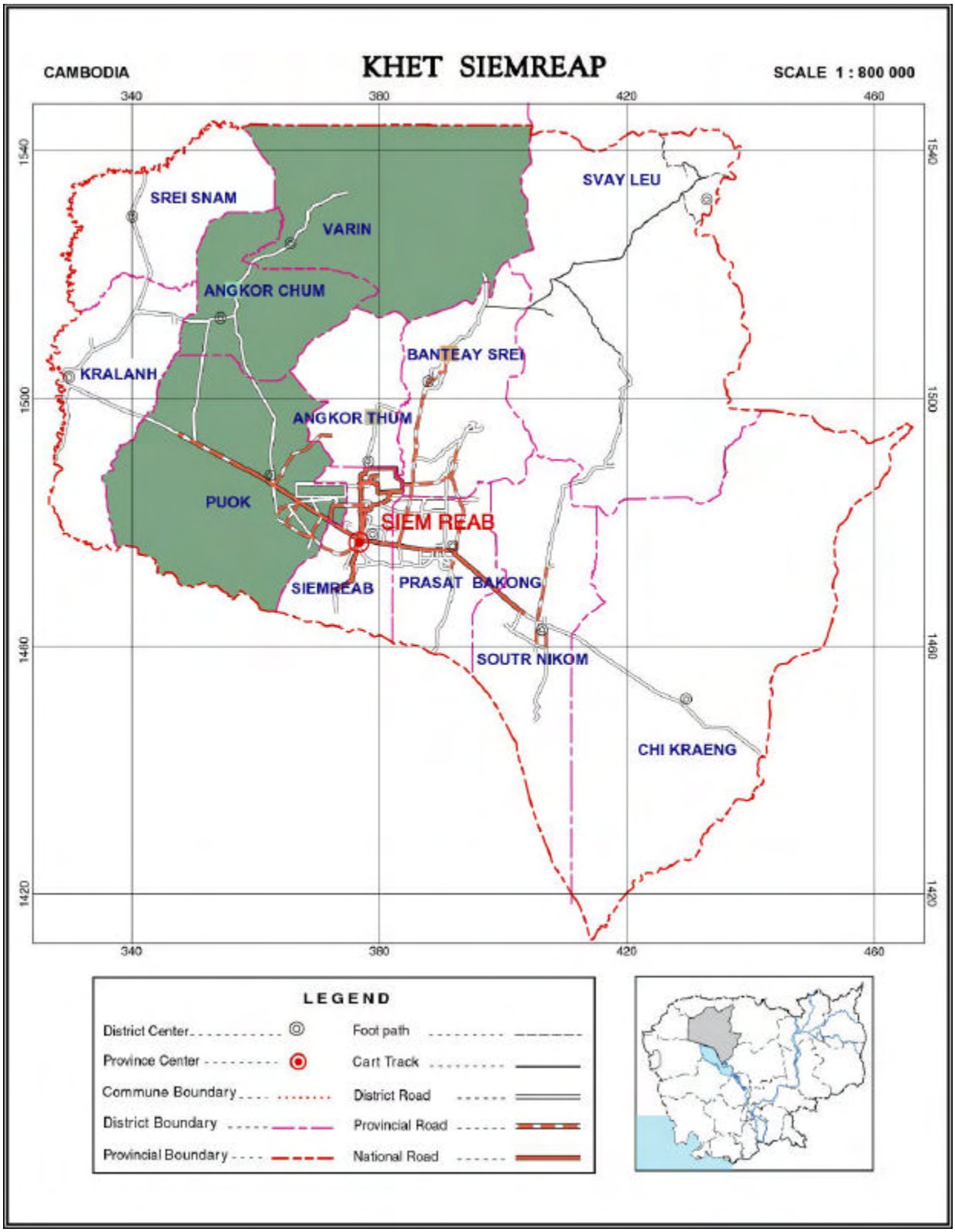
Attachment F7: Siem Reap Integrated Child Health Project: Indicator Performance Tracking Table

strategy element	performance indicator	Rapid Catch Indicator	HMIS Indicator	Cambodia Score Card Indicator	frequency of collection	baseline value	EOP: target	Notes
Strategic Objective One: Improved nutritional status of children under two								
growth monitoring	percentage of children aged 0-23 months who are less than 2 standard deviations below the median weight-for-age of the reference population				baseline & endline	35.7	25	
Intermediate Result: Improved care of pregnant women								
antenatal care	percentage of women with 2 or more ANC visits				quarterly			Health Center & CBSS
tetanus toxoid 2	percentage of women receiving at least two tetanus toxoid injections before the birth of their last child				quarterly	59.9	90	
careseeking behavior	percentage of women who can recognize three or more danger signs of pregnancy				endline	tbd		survey
	percentage of children age 0-11 months whose births were attended by skilled health personnel				annual	15.3	25	
Intermediate Result: Increased early and exclusive breastfeeding								
initiation	percentage of children breastfed within the first hour of delivery				annual	42.8	60	
exclusive breastfeeding	percentage of children exclusively breastfed for six months				baseline & endline	21.4	25	CBSS
Intermediate Result: Improved appropriate use of complementary foods								
complementary foods	percentage of children age 6-9 months who received breastmilk and complementary foods within the last 24 hours				baseline & endline	81.7	95	
	percentage of mothers who can name five or more vitamin A-rich foods				annual	tbd		survey
Strategic Objective Two: Improved Immunization Rates								
full immunization	percentage of children 12-23 months who are fully vaccinated before first birthday				annual	34	80	survey
Intermediate Result: Improved routine immunization rates								
routine immunization	percentage of children 12-23 months who received a measles vaccine				monthly	88.8	100	health center
Intermediate Result: Improved Vitamin A coverage								
child VAC	percentage of children less than 23 months who received a VAC dose				monthly	48.3	95	health center
pregnant women VAC	percentage of post-partum women who received VAC dose within 8 weeks of delivery				monthly	tbd		
Strategic Objective Three: Enhanced Community Prevention & Management of Sick Child								
overall prevalence	percentage of children with symptoms of illness (cough, diarrhea, fever) during the last two weeks				baseline & endline	65	40	

strategy element	performance indicator	Rapid Catch Indicator	HMIS Indicator	Cambodia Score Card Indicator	frequency of collection	baseline value	EOP: target	Notes
	number of cases of childhood illnesses referred appropriately to health center in the last month				quarterly			
Intermediate Result: Improved caregiver knowledge of childhood illnesses								
community outreach	percentage of mothers age 0-23 months who know at least 2 signs of childhood illness that indicate the need for treatment				baseline & endline	57.9	90	
Intermediate Result: Improved caregiver home management of childhood illnesses								
careseeking behavior	percentage of sick children age 0-23 months who received increased fluids and continued feeding during an illness in the last two weeks				baseline & endline	53.7	70	
	percentage of mothers of children 0-23 months who seek care for their child with cough or fast/difficult breathing in the last 2 weeks				baseline & endline	67	80	
	percentage of mothers of children 0-23 months who seek care for their child with severe diarrhea in the last 2 weeks				baseline & endline	70	80	
	percentage of mothers of children 0-23 months who seek care for their child with fever in the last 2 weeks				baseline & endline	57.1	75	
Intermediate Result: Improved prevention & treatment of childhood illnesses								
diarrhea	percentage of mothers with children age 12-23 months who report that they wash their hands with soap/ash at all appropriate moments in the previous day				baseline & endline	0.6	10	
	percentage of children age 0-23 months who had diarrhea during the last two weeks				baseline & endline	35	30	
	percentage of children age 0-59 months who had diarrhea and were treated with ORT				quarterly	tbd		U5 data is collected using the CBSS
malaria	number of children age 0-23 months who slept under a LLIN the previous night				endline	0	7,000 net	
Strategic Objective Four: Improved Partner Project Management Capacity								
volunteer management	percentage of volunteers retained for more than one year				annual	0	90%	

Key	
	Rapid CATCH indicator
	HMIS Indicator
	Cambodia Score Card Indicator

Attachment F8: Map of Project Site



Child Survival and Health Grants Program Project Summary

Oct-26-2006

American Red Cross, International Services (Cambodia)

General Project Information:

Cooperative Agreement Number:	**GHS-A-00-04-00007-00**
Project Grant Cycle:	**20**
Project Dates:	**(9/30/2004 - 9/29/2008)**
Project Type:	**Standard**
ARC Headquarters Technical Backstop:	**Patricia David**
Field Program Manager:	**Robert Kolesar**
Midterm Evaluator:	**Richard Crespo**
Final Evaluator:	
USAID Mission Contact:	**Charya Hen**

Field Program Manager Information:

Name: **Robert Kolesar**
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Alternate Field Contact:

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Funding Information:

USAID Funding:(US $): $1,500,000 **PVO match:(US $)** $500,096

Project Information:

Description:

The project goal is to reduce the high morbidity and mortality through Nutrition (LOE 15%) and Breastfeeding (20%), Immunization and Vitamin A (LOE 25%),and Community management of the sick child (LOE 30%) and Maternal Newborn Care (LOE 10%).
The project interventions will be implemented through the following four major cross-cutting strategies: (1) Health education/coaching for behavior change through an extensive network of CRC volunteers; (2) Community mobilization for behavior change achieved by engaging opinion leaders and motivating community-based activities to reinforce health communication through the CRC volunteers; (3) Coordination and continued involvement of other implementing partners to ensure synergistic program approaches; and (4) Community-based surveillance systems that complement and support existing Health Management Information Systems (HMIS).

Location:

Angkor Chum Operational District (OD).

Project Partners	Partner Type	Subgrant Amount
Cambodian Red Cross	Subgrantee	$501,051.00
Ministry of Health	Collaborating Partner	
RACHA	Collaborating Partner	
Population Services International	Collaborating Partner	
Plan International	Collaborating Partner	
Belgium Technical Cooperation	Collaborating Partner	
CARITAS	Collaborating Partner	
Adventist Development and Relief Agency	Collaborating Partner	
Subgrant Total		$501,051.00

General Strategies Planned:

Social Marketing

M&E Assessment Strategies:

KPC Survey
Health Facility Assessment
Organizational Capacity Assessment with Local Partners
Participatory Learning in Action
Community-based Monitoring Techniques
Participatory Evaluation Techniques (for mid-term or final evaluation)

Behavior Change & Communication (BCC) Strategies:

Social Marketing
Interpersonal Communication
Peer Communication
Support Groups

Groups targeted for Capacity Building:

PVO	Non-Govt Partners	Other Private Sector	Govt	Community
US HQ (General) US HQ (CS unit) CS Project Team	Local NGO	(None Selected)	(None Selected)	Other CBOs CHWs

Interventions/Program Components:

Immunizations (15 %)

(IMCI Integration)
(CHW Training)
- Classic 6 Vaccines
- Vitamin A
- Surveillance
- Mobilization

Nutrition (15 %)

(IMCI Integration)
(CHW Training)
- Comp. Feed. from 6 mos.
- Cont. BF up to 24 mos.
- Growth Monitoring

Vitamin A (10 %)

Pneumonia Case Management (10 %)

(IMCI Integration)
(CHW Training)
- Recognition of Pneumonia Danger Signs

Control of Diarrheal Diseases (10 %)

(IMCI Integration)
- Hand Washing
- ORS/Home Fluids
- Feeding/Breastfeeding
- Care Seeking
- Case Mngmnt./Counseling
- Zinc

Malaria (10 %)

(IMCI Integration)
(CHW Training)
- Access to providers and drugs
- Antenatal Prevention Treatment
- ITN (Bednets)
- Care Seeking, Recog., Compliance

Maternal & Newborn Care (10 %)

(IMCI Integration)
(CHW Training)
- Recog. of Danger signs

Breastfeeding (20 %)

(IMCI Integration)
(CHW Training)
- Promote Excl. BF to 6 Months

Target Beneficiaries:

Infants < 12 months:	6,362
Children 12-23 months:	6,238
Children 0-23 months:	12,600
Children 24-59 months:	17,966
Children 0-59 Months	30,566
Women 15-49 years:	48,521
Population of Target Area:	213,749

Rapid Catch Indicators:

Indicator	Numerator	Denominator	Percentage	Confidence Interval
Percentage of children age 0-23 months who are underweight (-2 SD from the median weight-for-age, according to the WHO/NCHS reference population)	0	0	0.0%	0.0
Percentage of children age 0-23 months who were born at least 24 months after the previous surviving child	0	0	0.0%	0.0
Percentage of children age 0-23 months whose births were attended by skilled health personnel	0	0	0.0%	0.0
Percentage of mothers of children age 0-23 months who received at least two tetanus toxoid injections before the birth of their youngest child	0	0	0.0%	0.0
Percentage of infants age 0-5 months who were exclusively breastfed in the last 24 hours	0	0	0.0%	0.0
Percentage of infants age 6-9 months receiving breastmilk and complementary foods	0	0	0.0%	0.0
Percentage of children age 12-23 months who are fully vaccinated (against the five vaccine-preventable diseases) before the first birthday	0	0	0.0%	0.0
Percentage of children age 12-23 months who received a measles vaccine	0	0	0.0%	0.0
Percentage of children age 0-23 months who slept under an insecticide-treated bednet the previous night (in malaria-risk areas only)	0	0	0.0%	0.0
Percentage of mothers who know at least two signs of childhood illness that indicate the need for treatment	0	0	0.0%	0.0
Percentage of sick children age 0-23 months who received increased fluids and continued feeding during an illness in the past two weeks	0	0	0.0%	0.0
Percentage of mothers of children age 0-23 months who cite at least two known ways of reducing the risk of HIV infection	0	0	0.0%	0.0

Percentage of mothers of children age 0-23 months who wash their hands with soap/ash before food preparation, before feeding children, after defecation, and after attending to a child who has defecated	**0**	**0**	**0.0%**	**0.0**

Comments for Rapid Catch Indicators