



**Pilot Community Integrated Management of
Childhood Illness Project
Pursat, Cambodia**



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1. Summary

This paper reviews the achievements and lessons from CARE's pilot Community Integrated Management of Childhood Illness Project (C-IMCI) in Cambodia with the intention of informing future programs. CARE's C-IMCI pilot was implemented over 18 months, in 28 villages of Bakan Operational District (OD) in Pursat Province. The project budget was US \$104,000, of which the initial \$54,000 was from "CARE Innovation Funds" generated from private donors, and an additional \$50,000 was from the Packard Foundation.

The overall project goal was to reduce under-five morbidity and mortality. The project had two objectives: 1) improved household practices and 2) strengthened health systems with emphasis on improving provider practices and links between families, drug sellers, and health providers. An implicit goal was also to test and identify effective strategies to improve child health, with the intention of replicating successful strategies.

At the end of 18 months the project had disseminated health messages to 779 mothers, formed 36 community mother's clubs, and trained 96 providers and 36 mother's club facilitators. Trained providers included 5 midwives, 9 health center staff, and 46 village drug sellers or private providers. In addition, the project designed a "picto-book" as a learning guide for low-literate providers, which attracted significant national interest. The picto-book is likely to be adapted for use in other parts of the country and with families as well as providers. The project directly reached most public sector providers, many private drug sellers, and 15% of mothers and pregnant women. An additional 15% of mothers were probably reached through contacts with providers trained by CARE.

The CARE C-IMCI Project's greatest contribution was the inclusion of popular private drug sellers in addition to government providers in the strategy. Since drug sellers represent the first line of contact for most families with sick children, training and establishing them as referral links to government providers has great potential for improving illness case management. This innovation represents an important and impressive step forward in reducing harmful practices by drug sellers and forging a path to reverse the upward child mortality trend. Reducing harmful practices from private drug sellers is an important complement to improving the quality of services in the public sector. CARE's innovative strategy, and the materials and methodology used for implementation have widespread relevance to child health efforts throughout Cambodia.

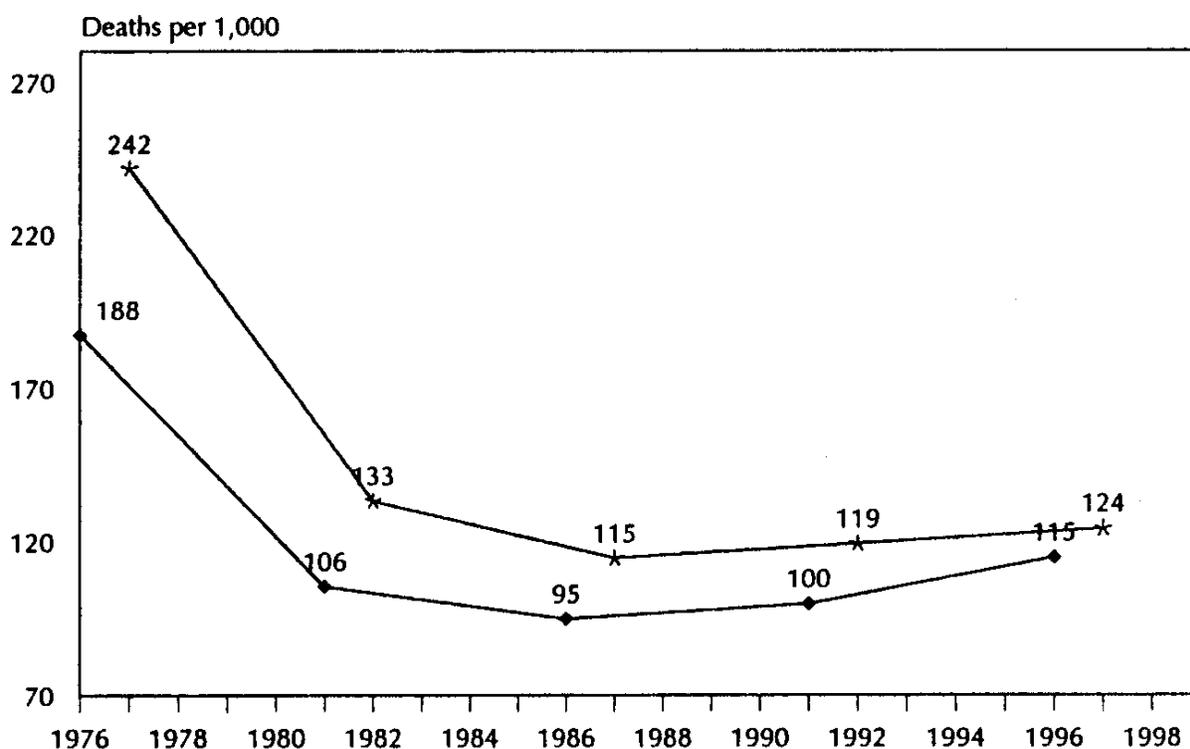
The project achievements were commendable especially in light of the management, technical, and financial issues it faced. Eighteen months and \$104,000 was insufficient to achieve stated project objectives or complete a baseline and end line assessment. The project also faced multiple changes in leadership and management. Nonetheless, a team of dedicated staff successfully implemented most activities as planned and established excellent rapport with MOH officials at the provincial and national levels. The C-IMCI pilot is well positioned to influence national program strategies for improving child health.

2. Background

In Cambodia child mortality rates are high and increasing. The U5MR is 122/1000, the IMR is 93/1000, and the MMR is 247/100,000 live births. In Pursat mortality is even higher with an IMR of 139/1000 and U5MR of 173/1000 live births. In other words, one in every seven babies dies before his/her first birthday, and one in six before his/her fifth birthday.

Over the past decade infant and child mortality have in fact increased by 20% and 8% respectively. Post-neonatal mortality has increased by 71% and accounts for 61% of infant mortality, unlike most other contexts in the world.¹ Acute respiratory illness, diarrhea, and vaccine preventable diseases, particularly neonatal tetanus and measles, account for the majority of under-five deaths in Cambodia and in Pursat.

Figure 1: Under Five Mortality Trends



Source: *CDHS, 2000 (top line) and ●NHS, 1998 (bottom line)

Malnutrition, compounded by intestinal infections, is prevalent and the underlying cause of death in 50% of child deaths. Poor quality health services and irrational drug use present a great challenge to improving child health. The C-IMCI pilot project represents CARE's response to these major causes of childhood mortality. The pilot intended to test innovative strategies to improve illness case management and reduce harmful drug dispensing, as a means of reducing childhood deaths.

¹ PATH/WHO, 2001

Pursat Province was appropriately selected for this pilot project, given mortality and malnutrition rates, and child health and care seeking practices, similar to or worse than other parts of Cambodia. A summary of relevant data from the 2000 the Cambodian Demographic and Health Survey are presented below as reference.

Table 1: Under five Mortality and Malnutrition Rates¹

Indicator	Mortality Rates	Cambodia	Pursat
Mortality	Neonatal mortality Rate	37.3	51.0
	Post-neonatal mortality rate	57.8	NA
	Infant Mortality Rate	92.7	139.4
	Under 5 mortality rate	121.6	172.7
	Estimated number of U5 deaths/yr ²	43,788	1,739
Malnutrition	Stunting (children under 5)	44.6	46.3
	Wasting (children under 5)	15.0	13.4
	Underweight (children under 5)	45.2	46.3
	Anemic <11g/dl (children under 5)	63.4	69.2
	Night Blindness (children under 5)	NA	NA

Source: CDHS, 2000.

**Table 2:
Coverage Rates of Health Behaviors associated with under-five mortality**

	Cambodia %	Pursat %
Pneumonia case management (children under 5)		
. Received care from any provider for fever/ARI ^a	71.9	89.3
. – care from public medical sector	12.5	11.8
. – care from private medical sector	22.0	14.4
. – care from non-medical sector	37.4	63.1
Diarrhea case management (children under 5)		
. Received care for diarrhea at a health facility	21.6	13.5
. Gave home based ORS, RHF, ORS, or rice water	47.6	47.6
. Consumed as much or more food	41.8	NA
. Consumed extra fluids as prior to illness	53.1	46.2
. Consumed ORS during diarrhea	17.8	8.2
Maternal and Child Nutrition		
. Put to the breast within one hour	11.0	5.7
. Put to the breast within one day	24.4	17.4
. Received only breast milk for 6 months	2.0	NA
. Received Vitamin A in past 6 months (children 6-59mo)	28.5	21.5
Primary Immunizations by age 1 (children 12-23mo)		
. Completely vaccinated by age 1	35.5	31.3 ^a
. Received measles by age 1	48.4	41.4 ^a
. Mother received 2 TT before delivery	30.0	33.2

^a For Pursat Province coverage rates are for children 12-24 months at the time of survey, and not by age 1.
Source: CDHS, 2000.

3. Project Objectives and Strategies

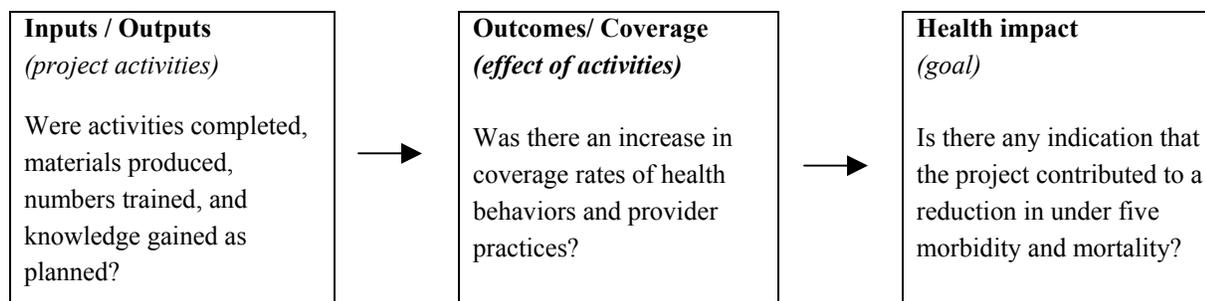
The project had two key objectives:

- To achieve improved household health and nutrition practices associated with low mortality.
- To strengthen health systems, with emphasis on improving provider practices and links between providers and families.

To achieve improved household health and nutrition practices, CARE educated mothers of children under five on appropriate prevention and care practices and encouraged them to adopt healthy family practices. In addition, CARE worked with providers to improve their guidance to families on illness case management. To improve provider knowledge, skills, and competencies CARE trained private and public sector providers. CARE financed IMCI training for PHD, OD, and health center staff, in addition to training both health center staff and drug sellers on more appropriate and less harmful practices, especially related to drug dispensing. To improve links between public and private providers and communities, the project involved health facility staff in community education and facilitated communication between health center staff, village drug sellers, and communities.

4. Assessment Framework

The framework below was used to guide the review of this project. This review first examines project outputs, then estimates progress towards stated health outcomes, and finally assesses potential contribution to health impact. These are measured against the goals, objectives, and activities stated in the project proposal.



5. Data

The pilot C-IMCI Project review was based on 3 days of field observations and interviews with staff, counterparts, providers, and mothers; a review of the picto-book; and the review of internally generated survey data and quarterly progress reports. The end line survey results presented in this report need to be reviewed with the following in mind: The end line quantitative survey was designed internally and employed interviewers from the Pursat MCH department who would benefit from a successful evaluation. Survey questions also varied from standard questions and indicators, and the sampling was not population based or random. Finally, the project has no baseline because the original budget was inadequate and at end line the comparison group was a non-equivalent smaller group of mothers who did not attend mother's clubs. Issues with data reliability and consistency also limited assessment of behavioral outcomes.

6. Assessment of Inputs and Outputs

6.1 Project activities

The project achieved most activities as planned. The table below lists completed activities each quarter, and provides an outline of the implementation process.¹

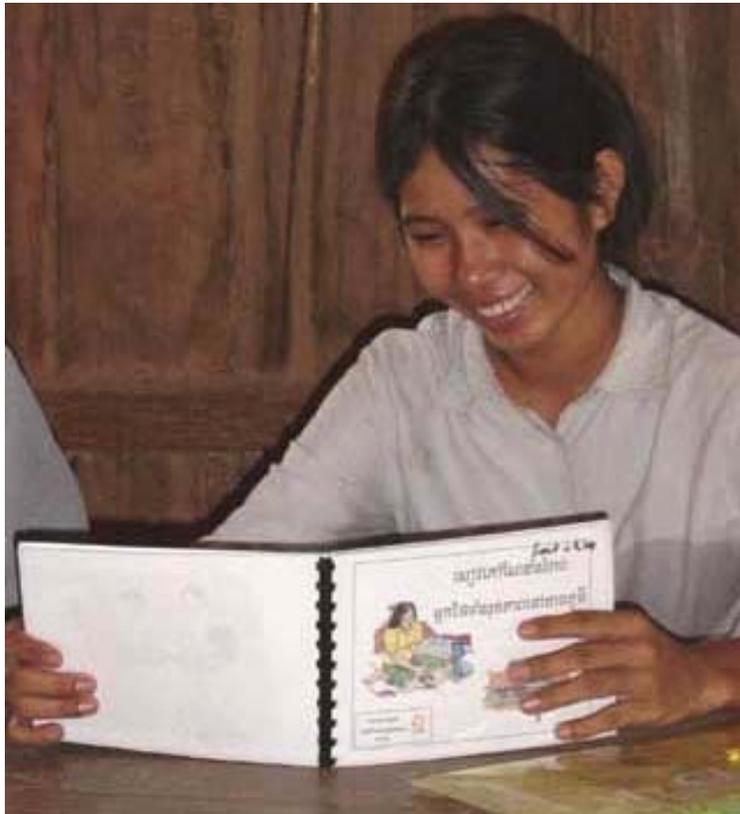
Table 3: Project outputs and activities completed each quarter

Jul-Sept 2001	<ul style="list-style-type: none"> ▪ Seconded 3 health center midwives and 2 OD staff, and set up office ▪ Re-designed project strategies, implementation and evaluation plans, and log-frame ▪ Sent 8 CARE staff and MOH staff to 5-day course on training methodology ▪ Sent CARE health training officer and seconded OD staff to 11 day IMCI training
Oct-Dec 2001	<ul style="list-style-type: none"> ▪ Recruited 36 MC facilitators and organized 36 mother's clubs involving 784 mothers in 18 villages ▪ Recruited 46 village drug sellers in 28 villages ▪ Initiated the design of a CIMCI manual responsive to the local context and understanding ▪ Trained 4 midwives on 3 health messages: breastfeeding; and control and prevention of diarrhea ▪ Trained 8 health center staff in ARI, CDD, nutrition, and malaria (refresher course) ▪ Trained 36 MC facilitators in breastfeeding messages and information to disseminate to mother's clubs ▪ Sent M&E officer to KAP survey seminar in Battambang, sponsored by CRC
Jan-Mar 2002	<ul style="list-style-type: none"> ▪ Delivered follow-up messages to 511 mothers on breastfeeding at mother's clubs ▪ Trained 440 mothers, 36 MC facilitators, and 6 midwives in CDD and home care at mother's clubs ▪ Delivered follow-up messages on CDD/home care to 231 mothers during mother's clubs ▪ Delivered 5-day C-IMCI course to 19 Metik and Svaydonkeo commune drug sellers ▪ Delivered follow-up training on ARI, CDD, nutrition, and malaria to 3 health center staff ▪ Sent CARE health training officer to 5 day IMCI facilitator's training in Siem Reap ▪ Administered breastfeeding skills checklist to 269 mothers
Apr-Jun 2002	<ul style="list-style-type: none"> ▪ Delivered messages on CDD/home care to 543 mothers, and follow-up messages to 577 mothers ▪ Trained 5 health center midwives and 36 mother's club facilitators on CDD home care / prevention ▪ Produced 900 t-shirts to use as incentives to mother's club members ▪ Trained 17 village drug sellers in Otapong commune on the 5-day C-IMCI curriculum ▪ Delivered C-IMCI follow-up messages to 27 village drug sellers ▪ Sent CARE health education officer to the Maternal and Newborn health training in Siem Reap ▪ Organized and participated in IMCI planning workshop attended by OD, PHD, and health center staff ▪ Designed a skills checklist for drug sellers and mothers ▪ Administered CDD home skills checklists to 416 mothers and pre-test on DHF, ARI, and nutrition
Jul-Sept. 2002	<ul style="list-style-type: none"> ▪ Delivered follow-up IMCI training to 17 drug sellers ▪ Trained 5 health center midwives and 36 MC facilitators in DHF, ARI, and nutrition ▪ Trained 728 mothers on DHF; 720 on ARI; and 648 on nutrition ▪ Reached an additional 112 mothers with messages on prevention of diarrhea; 69 DHF, and 129 on ARI ▪ Organized 11-day IMCI course for staff from the health center (9); OD (3); MOH (1); CARE (1); CRS (1); and Angkor Hospital for Children (4) ▪ Designed 3-day IMCI course and trained 13 health center staff unable to attend the 11-day course ▪ Financed 3 advertising billboards that were placed outside of Health Centers ▪ Designed, field-tested, and submitted "picto-book" for peer review ▪ Implemented mid-term contests with 642 mothers on breastfeeding and diarrhea prevention and home care; and final contests with 653 mothers on breastfeeding, CDD, DHF, ARI, and nutrition ▪ Completed 445 pre-tests on DHF, ARI, and nutrition ▪ Completed breastfeeding skills checklists with 269 mothers and CDD checklist with 499 mothers
Oct-Dec 2002	<ul style="list-style-type: none"> ▪ Trained 556 mothers on danger signs of severely ill children ▪ Revised and produced 60 copies of the picto-book, and disseminated it to 36 drug sellers trained in its use ▪ Sent 2 CARE staff to a national IMCI review workshop ▪ Designed and implemented a final evaluation survey ▪ Held workshop with PHD, OD, health center, and CARE staff to discuss project results and future plans

¹ CARE, C-IMCI Quarterly reports and staff inputs

6.2. Materials developed and disseminated

A very simple and attractive picto-book was developed for drug sellers to use as a guide when dispensing drugs and educating mothers about illness management and prevention. This picto-book has been field tested and revised, and is currently being reviewed by colleagues outside of CARE. Many organizations, including the MOH, have expressed an interest in adapting and replicating the picto-book to other parts of Cambodia for use with mothers and with health center staff. Comments on the picto-book are summarized in section 4 under recommendations, and detailed notes were written directly onto a copy of the picto-book and provided to project staff.



Drug seller reviews picto-book, designed to guide C-IMCI practices.

The picto-book, once finalized, will have wide-spread use for educating families about home management of childhood illness and orienting providers to harmful and helpful practices. Similar materials for C-IMCI are not currently available in Cambodia, and hence CARE's work in this area will be of value to child health programs in many parts of Cambodia. Family and provider comprehension of the picto-book content and the use of the book as a guide should be reviewed so that incremental improvements can be made as and when required.

6.3. Training

Persons trained: The project trained health center providers, drug sellers, and mothers who attended mother’s clubs organized by the project. In addition to the 11-day IMCI course provided to 16 government staff, the project also reached 46 village drug sellers. The number of people trained in each topic is listed below:

Table 4: Persons trained, by topic

Type of person trained	Total	Coverage of persons trained, by topic - % (n)						IMCI or C-IMCI
		Illness management			Nutrition and prevention			
		Diarrhea	ARI	Dengue	Breast-feeding	Nutrition	Diarrhea prevention	
Pregnant Women and Mothers of children U5 Providers	5,111	8.6% (440)	14.1% (720)	14.2% (728)	15.2% (779)	12.7% (648)	14.2% (728)	NA
OD staff	NA	NA	NA	NA	NA	NA	NA	3 ^a
Health Center staff	14	57%(8)	57%(8)	0	64%(9)	64%(9)	NA	64%(9) ^a
Midwife	8	63%(5)	50%(4)	63%(5)	63%(5)	50%(4)	63%(5)	100%(8) ^a
Drug Sellers	46	NA	NA	NA	NA	NA	NA	46 ^b
MC facilitators	36	100%	100%	100%	100%	100%	100%	100%

^c 9 health center and 3 OD staff received 11-day IMCI course in Angkor Children’s Hospital in Siem Reap.

^a 6 health center staff and 8 midwives received 3-day IMCI training in Pursat by colleagues who received 11-day IMCI training.

^b 46 Drug sellers received a 5-day C-IMCI course, plus one day follow-up, and a 1 day training on the picto-book.

^c 36 of the 42 villages had mother’s clubs and MC facilitators. All 36 MC facilitators were trained in C-IMCI.

Training content and methods: Training of mothers was conducted by CARE staff and by Mother’s club facilitators under the supervision and support of CARE staff or counterparts. Trainings were prepared presentations on C-IMCI family practices, focused on information and message dissemination. Project staff report that mother’s clubs were “participatory forums where ideas were discussed and formulated.” Contests were used to test participants’ ability to recount health messages, and gifts were presented for attendance and demonstrated knowledge, but not for health practice.

Drug sellers received a 5-day training that covered 1) C-IMCI family practices, 2) referral of patients to the government health center, and 3) inappropriate and dangerous dispensing of antibiotics for the treatment of childhood illness. Health center staff received a formal 11-day IMCI course which was conducted by national MOH master trainers paid by CARE, and a subsequent 3-day course for health center staff was conducted by peers who were able to attend the 11-day course. The 11-day course followed the national IMCI protocols and algorithms for illness diagnosis and case management.

6.4. Assessment of Knowledge retention following training

The assessment of knowledge retention was ascertained using post-tests immediately following and one to six months post-training. All groups showed an increase in knowledge post-test compared to the pre-test measure. The details of this change are presented in the tables that follow this section.

Health center staff: All 14 trained health center staff were tested at the end of the project. An assessment of knowledge found that all 14 trained health center staff could name the signs of dehydration; specify treatment with fluids and ORS as treatment for diarrhea, and define 40 breaths per minute as “fast breathing.” In addition, 12 of the 14 identified 1 or more ways to prevent malaria and named symptoms of malaria. When presented with a test-case, the average score of health center staff was 3.5 out of 4 for appropriate diagnosis and classification of illness; 14.6 out of 16 points for correct recording on the IMCI recording chart; and 3.25 out of 4 for appropriate treatment.

Midwives: Five trained midwives who worked regularly with the CARE team were tested at the end of the project. Of these, 4 could name the advantages of breastfeeding and 5 correctly said the newborn should initiate breastfeeding within 1 hour of birth; 3 could name the danger signs of diarrhea and all 5 specified the number of spoons of ORS to give for treatment; 4 could name 4 causes of diarrhea and 4 ways to prevent diarrhea; 2 could name 3 ways to take care of a child with Dengue and 4 could name ways to prevent dengue.

Drug sellers: Thirty three of the 46 trained drug sellers were tested at the end of the project. The assessment of post-training knowledge of drug sellers suggests that training successfully increased knowledge. Interviews with three drug sellers by the external reviewer also reflected correct knowledge of medications and their use. These results are presented in table 5.

Mother’s club facilitators: Thirty five of the 36 mother’s club facilitators were tested at the end of the project. Mother’s club facilitators demonstrated a lower level of knowledge than other groups when asked to name the advantages of breastfeeding (51%), ways to prevent diarrhea (71%) and dengue (69%); and symptoms of severe ARI (2%). But for other questions more than 90% gave the expected answer. The results of the post-test can be found in table 6.

Mothers: Two hundred and eighty one of the 779 mothers who attended mother’s clubs were tested at the end of the project. Mothers demonstrated high knowledge levels one to six months post-training. For breastfeeding and nutrition questions, more than 90% answered correctly; for diarrhea home care and prevention question more than 85% answered correctly; for dengue questions more than 85% answered correctly; and for ARI 61% answered correctly. These results are presented in table 7.

Table 5: Knowledge of village drug sellers following training

(in total there were 46 trained drug sellers)

Topic	Expected answer 'correct answer'	% answering correctly			
		Pre- test (n=46)	Post-test Immediately Post training (n=46)	Post-test 2-3mo (n=44)	Post-test 6-7 months (n=33)
When should newborns start breastfeeding?	Within 1 hour	33	100	96	97
How many months should child receive only breast milk?	6	33	96	98	94
Name 2 foods that help protect a child from disease.	Vegetables Fruits ^a	13	43 ^g	96	64
How many times in the first year of life does a child need immunization against 6 diseases?	5 ^b	23	97	72	71
If child has fever, what medicine reduces it?	Paracetamol	83	100	100	97
If child has diarrhea with blood, what medicine should be given? ^c	Bactrim (Cotrimoxazole)	--	--	91	91
How many days should you give an antibiotic?	5	11	83	72	91
What happens if you give antibiotics for less than the number of days	does not get well ^d builds resistance	65	96	96	91
When should people wash hands?	Before eating, after defecation	--	--	90	57
What food should be given to a sick child?	Small amounts of soft nutritious foods, like rice porridge. ^e	--	--	93	52
For what danger signs would you advise the mother to take the child to the health center or RH immediately?	Unable to eat/drink Unconscious/lethargic Difficulty breathing Signs of dehydration Blood in stools; High fever for more than 2 days.	--	--	78	46
Drug seller can read drug chart ^f		--	--	70	69

^a The "correct answer" to this is a balanced diet to keep child well nourished and thereby help protect a child from disease, not "fruits and vegetables" only. What was taught might not be correct practice.

^b The "correct answer" can be 9: DPT1, DPT2, DPT3, OPV0, OPV1, OPV2, OPV3, BCG, Measles.

^c Survey questions at pre- and post-test were not comparable and therefore not included.

^d In reality, many children get better after 2-3 days on antibiotics which is the reason they don't buy the full course. It is possible that respondents answered based on what really happened and not what you taught them would happen.

^e The more "correct answer" is "as much or more food and water than the child received before the illness, and not necessarily "soft mushy foods."

^g Higher knowledge 3 and 6 months post-training, compared to immediately post-training, may be a result of follow-up training and on the job guidance.

Table 6: Knowledge of Mother's Club facilitators¹ following training

(All 36 trained MC facilitators were interviewed at one point or another)

Question	Expected reponses	Pre-test (n=36)	2-3 months post-training (n=36)	1-6 months post-training ² (n=35)
Breastfeeding				
What are the advantages of breastfeeding immediately? (Could name 5 advantages)	Assists uterus contraction and placenta delivery; reduces bleeding; stimulates breast milk production; protects child from infection.	39%	67%	51%
Diarrhea				
What substances are lost when a child has diarrhea? (Could name 2 things)	Food; water.	36%	50%	94%
How many spoonfuls of ORS should you give a child under 2 years after each diarrhea?	10 or more.	25%	72%	97%
What are danger signs that we should refer a child immediately to the health center or hospital? (Could name 5 danger signs)	Diarrhea with fever; diarrhea with vomiting; blood in the stool; breastfeeding, drinking, or eating poorly; diarrhea not better after 3 days.	22%	72%	91%
What should we do to prevent diarrhea? (Could name 4 ways)	Wash hands before cooking, eating, and after defecating; cover food from flies; defecate in latrines or bury feces.	33%	81%	71%
Dengue				
How can we prevent Dengue hemorrhagic fever? (Could name 4 ways)	Have child sleep inside bed net during the day; bury water containers under land; wash water jars or apply Abate; clean the area surrounding your house.	5%	100%	69%
ARI				
What are the symptoms of simple ARI? (Could name 3 symptoms)	Runny nose; cough; low fever.	8%	97%	97%
What are the symptoms of severe ARI? (Could name 4 symptoms)	Unable to drink or breastfeed; difficult breathing; in drawing of chest; fast breathing.	0%	31%	2%
If a child has one or more symptoms of simple ARI, how should you care for him/her? (Could name 3 ways)	Frequently breastfeed & keep warm; feed more food; give water mixed with lemon juice and sugar to reduce sore throat and cough.	8%	72%	40%

¹ Response rate is high (97% of the 36 Mother's club facilitators responded)² Rates may be inflated because some respondents were tested less than 3 months after training.

Table 7: Knowledge of Mother’s Club members following training (In total 779 trained mothers)

Question	Expected responses	Pre-test	2-3 months post-training	1-6 months post-training ¹
Breast feeding/nutrition			n=269	n=281
How long after birth should you first put your child to the breast?	Immediately (within 1 hour).	NA	73%	98%
During the first 6 months after birth should you give anything other than breast milk?	No.	NA	79%	98%
What should you feed a child less than 6 months? ²	Only breast milk, not even water.	5%	NA	95%
How many times a day should a mother breastfeed her child?	At least 8 times.	2%	NA	92%
What foods should children over six months old be given? (Could name 1 correct food to give)	Breastfeed as needed; ripe fruits; nutritious rice porridge (meat, fish, vegetables, oil). ³	2%	NA	91%
Diarrhea			n=499	n=281
Name 2 danger signs for diarrhea.	Diarrhea with fever, vomiting, or blood; Poor breastfeeding, drinking, or eating; Diarrhea not better after 3 days.	NA	90%	85%
Name 1 way to treat diarrhea.	Give ORS; take to health center; give more food/fluids than normal.	NA	94%	93%
How can you prevent diarrhea? (Could name at least 1 way)	Wash hands before cooking, eating, and after defecating; cover food from flies; defecate in latrines or bury feces.	NA	NA	86%
What things do you need to wash hands properly? (Could name at least 1 thing)	Water, soap, brush, towel or handkerchief; water bucket/scoop.	NA	NA	100%
Dengue		n=416		n=281
What causes Dengue hemorrhagic fever?	Aedes mosquito (tiger mosquito).	47%	NA	98%
What are the symptoms of Dengue? (Could name at least 1 symptom)	High fever; abdominal pain; lethargy; skin rash; cold fingers/toes; shivering, sweating.	28%	NA	98%
If a child has DHF how should you care for him/her? (Could name 1 way)	Frequent breastfeeding or water; more food; go to health center; do not give aspirin.	13%	NA	85%
What can you do to prevent DHF? (Could name at least 1 correct answer)	Sleep inside bed net during the day; bury water containers under land; wash water jars apply Abate; clean areas around house.	6%	NA	98%
ARI		n=445		n=281
What are the symptoms of severe ARI? (Could name at least 1 symptom)	Unable to drink or breastfeed; difficult or fast breathing; chest in drawing.	13%	NA	93%
If a child has symptoms of simple ARI, how should you care for him/her? (Could name 1)	Breastfeed frequently, keep warm, give more food; give water with lemon juice and sugar to reduce sore throat and cough.	2%	NA	61%
If a child has one or more symptoms of severe ARI, how should you care for him/her?	Take child to health center or Referral Hospital.	2%	NA	89%

¹ Rates may be inflated because some respondents were tested less than 3 months after training.

² The response is not consistent to a similar question (above)

³ Meat, fish, eggs, and some vegetables are not appropriate first foods.

7. Assessment of Behavioral Outcomes

The project aimed to improve provider practices and improve coverage of family behaviors associated with health impact or mortality reduction.

7.1. Provider practices

In Cambodia almost all children with diarrhea and respiratory symptoms receive antibiotics.¹ This project aimed to reduce the irrational and dangerous use of antibiotics, and promote appropriate management and prevention, by both drug sellers and government health center staff. There was no data to ascertain provider practices among trained health center staff, drug sellers, or mother's club facilitators. Since provider knowledge is not consistently associated with practice we cannot assume that improvements in knowledge improved case management practices. However, 96% (22 of the 23) of clients interviewed post consultation with 11 of the trained health center staff said they understood how and when to give prescribed medicine, were shown the IMCI counseling card, and felt that the overall service was good.

Among trained drug sellers interviewed at project end (n=33 of 46), 88% report an increase in drug sales; 70% an increase in antibiotic sales; 68% said they go to the health center less than before; 22% the same as before, and 10% more than before. Among drug sellers who themselves had a sick child in the past month (n=16), 88% gave their child antibiotics and 56% took their child to the health center. A decrease, rather than an increase, in drug and especially antibiotic sales was expected, since over-prescription was a recognized problem addressed by the project. These findings suggest that improved knowledge is not necessarily linked to appropriate antibiotic dispensing or use.² However, we have no way to ascertain if the increase in antibiotic dispensing is appropriate since we cannot match cases with treatment received. Addressing profit motive and the need to generate an income from drug selling may need to be addressed in any follow-on strategy.

Table 8: Assessment of drug seller behavior, given hypothetical presentation of symptoms

Symptom	Reported action when symptom presents (what they said they would do) n=33 of the 46 drug sellers trained by the pilot C-IMCI project
Fever	91% sell Paracetamol, 3% sell antibiotics, 24% refer to the health center, and 61% suggest sponging down the child
Diarrhea with blood	64% would refer the child to the health center 24% would sell ORS and 9% would suggest using ORS 48% sell antibiotics; 91% would sell Bactrim;
What happened when your child was sick? (this may be a better indication of actual practice)	42% had child who was sick since the training 88% gave their sick child antibiotics 56% took their child to the health center 68% said they go to the health center less than before; 22% the same as before, and 10% more than before. 97% said their children had better health than before and 100% attributed this to CARE training.

¹ MOH, Report of Early Implementation Phase of IMCI 1999-2002.

² The project advisor comments that an increase in drug sales may be the result of drug sellers now empowered to better care for their children at home and therefore seeking less care from health centers. She notes that "CARE did not teach drug sellers to sell less drugs. CARE taught them to sell drugs more thoughtfully. Increased sales was supposed to be a good thing since we encouraged mothers to shop at CARE-trained drug sellers. Increased sales was a benefit offered to drug sellers in return for training with CARE."

7.2. Family behaviors

The assessment of behavioral outcomes among mothers is done in two parts: first the rates of reported behavior among the subset of 779 women who received health education is presented, and second, rates of overall population coverage are projected based on current project reach.

Mother's club members: Compared to CDHS 2000 rates for rural Pursat, data generated from the internal survey indicate an increase in household practices among the 779 mothers reached by the project. These practices include improved diarrhea and ARI case management, breastfeeding, and nutrition. These results, though encouraging and instructive, should be interpreted with some caution because indicator definitions do not conform to international or national standards and sampling and implementation methodologies were not population-based or random. Therefore the rates are not exactly comparable with the CDHS rates used for baseline in table 9 below.

**Table 9: Family behaviors^{1,2}
n = 281 of the 779 mother's club members; selected by convenience sampling**

Performance measure (indicators)	Baseline³ Rural Pursat	Endline Bakan
(Expressed as the percentage who....)		
ARI/Pneumonia case management (children under 5)⁴ (when child had cough and difficulty breathing)		n=40
. Gave antibiotics (doses and duration not known)	% NA	% 40.0
. Consumed extra food/liquids as prior to illness	NA	2.5
. Took child to a government health center	11.8	35.0
. Took child to a private provider / drug seller	77.5	27.5
Diarrhea case management (children under 5)²		n=76
. Gave ORS	8.2	39.5
. Gave home based ORS, RHF, ORS, or rice water	47.6	NA
. Consumed as much or more food	NA	5.3
. Consumed extra fluids	46.2	5.3 ⁵
. Took child to a Health Center	NA	26.3
. Took child to a private provider	NA	25.0
. Gave antibiotics (not known if appropriate)	NA	38.2
Maternal and Child Nutrition		n=61
. Put newborn to the breast within one hour	5.7	93.4
. Put newborn to the breast within one day	17.4	98.4
. Consumed only breast milk for 6 months (Children <6 months)	2.0	79.0
. Consumed Vitamin A in past 6 months(children 6-59mo)	21.5	NA
Hand washing behavior (self reported)		n=278
. After cleaning baby	NA	28.1
. After going to the toilet	NA	43.5
. Before eating	NA	83.1
. Before preparing food	NA	86.0

¹ Immunization was part of the IMCI training, but coverage rates were not measured at end line. According to CDHS 2000, only 31% of children were completely immunized by age 1, and only 33% of pregnant women were immunized with TT2 before delivery

² Please note that the rates are calculated based on interviews with only 5% to 26% of the 779 women reached, and these women were selected by convenience sampling.

³ CDHS, 2000 used for baseline figures.

⁴ CDHS is for illness is past 2 weeks; Project survey is for illness in past month.

⁵ CDHS separated ORT and fluids; Project survey combines them.

Population-based coverage: Health information was disseminated to 779 (15% of the 5,111) pregnant women and mothers of children under 5 who were members of mother’s clubs. The end line survey results suggest a change in outcomes among these women. While this is an impressive start, population-based coverage rates of provider contact need to be significantly higher to achieve project goals. Moreover special emphasis on reaching women who are unable to attend mother’s club meetings is also critical. Women who cannot attend mother’s clubs are likely to be especially disadvantaged, have more children, and experience more illness episodes per child. It is unlikely that this project made a significant change in population-based coverage of health behaviors given direct population reach of only 779 or 15% of pregnant women and mothers with children under 5.

Table 10: Population Coverage

	Svaydonkeo		Otapong		Metik		Total Project Area	
	Total	Coverage % (n)	Total	Coverage % (n)	Total	Coverage % (n)	Total	Coverage % (n)
Health Center areas	1	100%	1	100%	1	100%	3	3
Villages	9	67% (6)	18	61% (11)	15	73%(11)	42	67%(28)
Population	6,373	---	15,488	---	12,326	---	34,187	---
Children under 5	880	12% ^a	2,138	10% ^a	1,700	17% ^a	4,718	12%
Children under 1	216	NA	529	NA	419	NA	1,164	NA
Pregnant women	243	NA	586	NA	468	NA	1,297	NA
Mothers of children under 5 and pregnant women ^b	954	14.4% (138)	2,315	12.0% (278)	1,842	19.7% (363)	5,111	15.0% (779)

^a Estimated as slightly lower than mothers and pregnant women

^b Estimated by adding together children under 5 and pregnant women, and reducing this number by 15% to adjust for women with more than one child under age 5.

Project activities were implemented in 28 of the 42 villages (67%), in all three of the originally planned communes or health center areas. However, project contacts with CARE-trained providers may represent up to an additional 15% of the population. In other words, if providers are now providing appropriate treatment, the project potentially improved case management of illness for up to 30% of children under 5. On the end line survey/checklist, drug sellers reported on average 6.3 cases per month, of which 2.3% were referred. The most common illnesses included fever (97%), diarrhea (63%), and cough (24%). From this we can estimate the annual caseload of the 46 trained drug sellers to be 290. CDHS reports the disease prevalence of ARI alone in Pursat to be 25% among children under 5. From this we can estimate that 1,179 or more of the 4,718 children under 5 were ill; and 290 or 25% of the cases were seen by CARE-trained drug sellers (this may be an over-estimate since some children were seen more than once).

8. Assessment of improved links between families and providers

There is no data to ascertain increased utilization of government health centers or referrals by drug sellers. However, CARE diligently involved health center staff in project activities, opened dialogue and rapport between health center staff and communities, and built positive personal relationships to increase client comfort levels. CARE stressed the utilization of the health center during all training activities, and encouraged drug sellers to refer patients to the health center. At mother’s clubs, CARE staff identified CARE-trained drug sellers as having received training from CARE. CARE also established excellent relationships with MOH staff at the health center, district, provincial and national levels.

9. Health Impact

The project goal was to reduce mortality and morbidity among children under 5 in Svaydonkeo, Otapong, and Metik Health Center catchment areas of Pursat Province. However, an assessment of mortality and morbidity reduction is impractical given the small population size, short project duration, and paucity of data on morbidity and mortality. A reduction in under 5 morbidity and mortality is also unlikely given project emphasis on outputs rather than behavioral outcomes, and project coverage of only 15%-25% of pregnant women and mothers in the project area with health messages. The degree to which these trained providers have improved their practices or influenced family health behaviors has yet to be fully assessed.

The project did however make an innovative leap by training village drug sellers as well as government providers about care during childhood illness, and producing a simple picto-book to guide practice. In part due to CARE's pilot project, other NGOs and the MOH are awakening to the importance of discouraging harmful practices and working with providers to reduce these practices.

Another notable achievement is the attention that the MOH is giving to Pursat. Since initiating the CARE IMCI Pilot, the Project has received many visitors from the MOH, WHO, and NGOs. Recently the MOH IMCI working group designated Pursat Province as a national IMCI pilot area. This means that health center staff across the whole province will be trained in IMCI and IMCI drugs and supplies to Pursat will be prioritized. This provides a supportive platform on which health center staff will be able to apply the skills they gained from their IMCI training and CARE will be able to strengthen and expand IMCI activities.

10. Recommendations for the current and future programs

The recommendations below important lessons demonstrated by the CARE C-IMCI Pilot Project that will be of value to both CARE and to other child health projects in Cambodia.

10.1. Program strategies

- **Improving the private health system:** To improve population-based coverage rates of illness case management, it is critical to improve the practices of private providers utilized by the vast majority of people as well as the practices of government providers. This includes drug sellers, drug distributors, shopkeepers, and private "doctors." Previous efforts focused on reaching government providers, who represent 11% of first contacts for child illness. CARE's work with private providers represents an important and impressive strategy to reduce harmful practices in the private sector, and increase referral and utilization of government facilities. Addressing provider needs to earn a income will be critical to achieving promoted practices.
- **Review and re-planning in program implementation:** The process of review, re-planning, and action is critical to achieving population based coverage of health practices. This can easily be incorporated into staff meetings where performance is reviewed vis-à-vis project objectives (not just activities, training, and curriculum), lessons are processed, and new improved actions are planned. The same process can be applied with community, NGO, and GO partners vis-à-vis their implementation roles.

- **Focus on achieving and sustaining behavioral outcomes:** The project planned for and achieved outputs and activities, which were unlikely to achieve behavioral outcomes or changes in household or provider practices. A shift to strategies (and rewards) for achieving behavioral outcomes is required at the community, health center, and CARE staff levels to improve coverage and have an impact on child health and survival.
- **Interactive approach is required to achieve behavioral outcomes:** An interactive approach that includes counseling will be more effective at supporting healthy actions, than a “message-based” approach that is not responsive to each client’s situation and less open to clarification and discussion. It would have been more impressive to achieve improved coverage rates of practice in at two of the prioritized IMCI intervention areas, rather than achieve the training schedule of 1 message in a different intervention every month.

10.2. Partnership and Sustainability

- **Institutional Sustainability:** More effort should be dedicated to working with existing community structures such as the Village Health Support Groups, Health Center Management Committees, Buddhist Wats, local NGO’s, and Commune Councils. Working within the existing system will leave increased chances for project sustainability.
- **Financial sustainability:** Externally provided financial incentives to mothers and providers for project participation should be phased out, since project activities are unlikely to continue without these inputs. Health center staff received per diems that far exceeded their salary, and village mothers received soap, kramas, and t-shirts for attendance and demonstrated knowledge.

10.3. Monitoring

- **Data use:** Structure the monitoring system so that the person collecting the data can analyze and use the information to improve his/her actions. A monitoring system can be used effectively to drive the program to results, if it is able to track behavioral outcomes rather than the activities and processes to get there.
- **Data accuracy and reliability:** Data accuracy may be enhanced by 1) careful review, editing, translation, and back-translation of data collection tools; 2) limiting the data collected to information useful to the person collecting it (staff, drug sellers, etc.) for action planning and decision making; 3) increasing staff and drug seller needs for accurate information to improve their performance or profits¹; 4) coaching staff on asking questions so that they are not leading to the answers; 5) separating monitoring from evaluation so that objective and outside evaluation serves to cross-verify monitoring systems. The more that data generated is used, the more likely it will be accurate and reliable.

10.4. Evaluation

- A project of this nature requires a concrete evaluation plan from the beginning so that pilot activities can be carefully analyzed and lessons from the experience can be maximized for future programs. While there are many factors that suggest project contributions to health knowledge and behavior, a structured baseline and end-line survey would have generated extremely useful information of interest

¹ Performance is measured by an external survey. The monitoring system generated internal information to help staff perform to the standards expected as measured by an external survey.

and utility to many organizations working on child health in Cambodia. This was planned for the CARE C-IMCI project, but not implemented due to insufficient funds.

10.5. Management

Leadership and supervision: Competent leadership sustained from project initiation to completion is critical, especially for pilot projects. To ensure a cohesive project team with long term vision and adequate supervision and feedback, 1) identify required capacities and recruit the right manager at the market salary from the beginning, 2) clarify second line of management and decision making in the absence of the manager, and 3) budget time and money for support from within and outside the organization.¹

Competent staff: It is critical to recruit, hire, and train capable staff that can provide leadership, continuity, and required skills throughout the life of the project. An assessment of required competencies for each position can be used to recruit new staff, and a comparison of required and available competencies can be used to set staff training and performance goals or shift staff in to positions that are more appropriate for their competencies. In addition, seconded government staff should be appropriate for their job. For example, male doctors may be unsuitable for training poorly educated village women.

Decision making authority and accountability: Clarify decision-making authority and accountability at the project, provincial, country, and CARE-Atlanta HQ levels from the beginning. Project staff perceived the pilot C-IMCI project to be CARE-Atlanta driven, hesitated to take actions without direction from Atlanta, and no one was held accountable for project performance. This was particularly difficult since support from Atlanta was not consistently available, especially during periods when there was no expatriate advisor.

Teamwork and coordination: To achieve project results, the team needs to work as a cohesive unit. In the current team individuals have separate goals and task lists, information and lessons are not freely shared, and activities are uncoordinated or duplicative. Creation of new tools and methods should be built on the experience of others, and staff should be commended for joint planning, action, and review.

Capacity building: Staff capacity building is required to improve staff motivation and performance and fill identified skill deficiencies. This includes building capacities for analysis and planning, developing learning tools, and facilitating review meetings at the community level. Short sessions incorporated into bi-weekly meetings or one-on-one coaching are ideal and appropriate to meet these human resource development needs, and would avoid cumbersome workshops and associated per diems. Capacity building should place emphasis on the application of skills, rather than attendance at training events.

¹ The original C-IMCI project budget did not have adequate funds for a senior expatriate field manager, nor adequate budget for support and supervision from CARE Phnom Penh. To address this problem, a short-term expatriate advisor was hired following approval from Atlanta, but left after 3 months for a permanent position. The initial national manager was a poor fit, despite continuous and focused managerial inputs from experienced managers. He was dismissed from the project midway. The manager from CARE's Jivit Thmey Project and a training consultant were asked to provide "stop-gap" support until funds and a person can be identified to provide project direction and management. In the final phase of the project, a new expatriate advisor was hired and worked closely with the Jivit Thmey Project manager and the C-IMCI team to successfully complete C-IMCI pilot project activities as planned.

Resource planning: Resource constraints limited CARE’s ability to implement the project and to assess lessons from this pilot. An assessment of minimum time and money is required before project initiation. The project as originally planned could not be implemented within 12 months or \$54,000. When faced with resource limitations reduce the interventions, objectives, and coverage as required, or postpone project initiation until sufficient resources are identified.

Appendix: Picto-book review and recommendations

CARE designed a “picto-book” for low-literate mothers and drug sellers focused on key “messages” related to infant feeding, disease prevention, and illness case management. Because the book filled a critical need for simple materials available to train communities and community providers, other organizations and the MOH have expressed an interest to review and adapt it for other contexts in Cambodia. The picto-book is currently being reviewed before revision and finalization. The comments below are intended to contribute to this process.

Overall notes: The picto-book presents a very simple and useful guide to the management of childhood illness, and as such represents an important contribution to facilitating improvements in under-five health status in Cambodia. The first half of the book that relates to preventive strategies requires more work and is of less utility given the availability of materials on these topics, compared to the latter half of the book that focuses on illness case management.

It is better to cover a few interventions in sufficient detail so people know how to implement the promoted action, rather than to cover many interventions areas superficially. This requires prioritization and selection of topics, perhaps based on their contribution to child health and well-being. Too much information in insufficient detail can be detrimental to achieving the goal. Information presented should be in sufficient details for mothers and providers to know HOW to practice promoted behaviors. For example, it saying that a child needs to have a balanced and nutritious diet which includes meat, eggs, and vegetables is not sufficient information to guide age appropriate feeding from 6 through 12 months, where different foods are appropriate at each stage. One alternative is to focus on illness case management (page 24 forward), and mentioning prevention “messages” in this context or at the end of the book, similar to the prioritization of the C-IMCI materials. At some later date CARE can produce other materials on infant feeding and nutrition.

Design the book for ***the mother*** who ultimately needs the information to keep her children alive and well, even though the book will also be used to educate and instruct village providers. This is most likely to achieve greater comprehension among low-literate providers and make it more likely that the information providers communicate occurs in a manner that is understood by most mothers.

Technical content

- **Incorporate**
 - Vitamin A, Mebendazole, and TT vaccines, perhaps as part of vaccine schedule

- Incorporate “good care when sick” on page 6
- “Giving only breast milk from birth to 6 months maximizes health benefits for the infant, and *fertility benefits for the mother*...in some context it’s the latter that motivates promoted behavior.
- Emphasize *Frequency* of feeding (its quantity, quality, and frequency that are important)
- Age appropriate information for each stage from breastfeeding, to introductory mushy solids, to small soft finger foods, to full and complete meals (see attached details).
- A discussion about what is not included in “exclusive breastfeeding”
- Current information on feeding can be improved by more age appropriate steps for optimal nutrition to be achieved by families. A illustrative chart is provided for your reference.
- **Exclude the following so the content is of manageable size and the book is less than 60 pages.**
 - Summary page on what children need to be healthy and messages on:
 - enough sleep, fresh air, time to play (p6/7)
 - malaria prevention and treatment since its not a problem in project area.
 - dengue, since it is unlikely to be a problem in the next 2-3 years.
 - The first 23 pages can be in a separate book. This front section also needs some more work.
- **Correct**
 - The current recommendation is to “breastfeed as long as possible, and at least until the child is two” not “to breastfeed until the child is 2 (implying stopping after age 2)
 - Pork, beef, eggs, oranges, and stringy vegetables, are not appropriate first foods (now listed on page 10 for 6 month old child)

Language: consider the following modifications, if it’s a problem with the Khmer version

- “Should:” Instead of “should do” – State the promoted behavior and the reason for it. For example, instead of “A mother should start breastfeeding immediately ...” say “Put the baby to the breast immediately after birth to improve chances of infant survival and quicken the expulsion of the placenta.”
- “first fluid.” In many contexts colostrum would not be described as a “fluid (its not perceived as fluid).” Double check understanding of this.
- “coconut juice” – make sure it’s the word for coconut water and not coconut milk
- Consider replacing existing title with “Guide to keeping children healthy.”

Illustrations: The strategy of using illustrations already used elsewhere in Cambodia is cost efficient and smart, and gave you a head start on picto-book design. But, some modifications may still be required to achieve enough comprehension to facilitate and support behavior change. Given that the audience is low to non-literate, also consider using text to explain the picture, rather than using pictures to illustrate the text. This will involve greater effort in making sure the pictures are understood and useful. Consider the following modifications after pre-testing:

- Picture healthy child on front page. Perhaps boy kicking ball on page 7.
- Picture girls as well as boys. Current pictures, when sex is distinguishable, all look like boys
- Picture rural people - You have non-rural looking people in some pictures (i.e. boy on page 6, woman with short skirt on page 9). This can be bad if the response is “this message is for rich people who live in the cities” or good if people want to emanate urban ways. Find out how it works in your context and decide if the picture requires modification.

- Perceived age - For each picture pre-test for perceived age, and modify picture to project correct age. For example, exclusively breastfed child on looks greater than 6 months (page 9); child under bed net looks like an adult (page 21); child with ARI on page 31 looks like older child (ARI is most prevalent and highest risk for child 6-11 months in Cambodia).¹
- Metaphors and symbols: Avoid or very carefully check metaphors for comprehension. For example, monsters throwing swords and boy with boxing gloves on page 7; cut flower with diarrhea on page 33; pill portions on pages 45-53; moon and sun pictures on pages 47-50)
- Placenta and cord (page 9) – did people understand this? The cord and afterbirth do not look like this.
- Exclusive breastfeeding picture on page 9 –Check on people’s perception of the age of this child, as well as their interpretation of what the “X” marks mean.
- Foods – The foods suggested are not age appropriate. For example, if a child is breast fed exclusively for 6 months, s/he will not be eating pork, beef, eggs, or oranges at 6 months (see page 11). I suggest using a phased chart for age appropriate foods (see sample attached).
- Hygiene – focus on one behavior (maybe hand washing). The picture on the top right is confusing.
- Immunization – Add TT (and Vitamin A?) to your chart.
- Dengue – the mosquitoes are so big – people had trouble with this in rural India, where I worked. Is it a problem here? Check perceived age of child
- ORS skills – page 41. Avoid picturing condensed milk cans as the measuring container for two reasons: 1) it may be interpreted that ORS should be mixed with 3 cans of condensed milk; and 2) you are inadvertently promoting the use of canned milk instead of breast milk. You can find another commonly used measuring “cup.” Water bottle can also be replaced by illustration that looks like a common water bottle (make sure it reflect common shape and label of the water bottle).
- Pill portions – consider using actual pill to show required portions, so that it is more easily understood by providers and the people that providers explain drug use to.
- Expiry date – Maybe take this one out all together if its not something people understand easily. Even with a current expiry date, up to 30% of the drugs may be inactive.

Layout and design

- Consider using black, white, and one other color to reduce cost per book, and make it less costly for local NGOs and the MOH to reproduce and scale-up.
- Consider format where text explains the pictures, rather than pictures illustrating the text, given the low literate audience for the material. This way, you will also place more emphasis on how well people understand the pictures.
- Consider doing two separate books instead of one. First focus on doing a very good book related to the management of childhood illness (starting on page 24). Include a limited amount at the ***end*** related to “Keeping children healthy, and preventing illness in the future, ” rather than put the prevention messages up front.

¹ CDHS, 2000, p. 156.