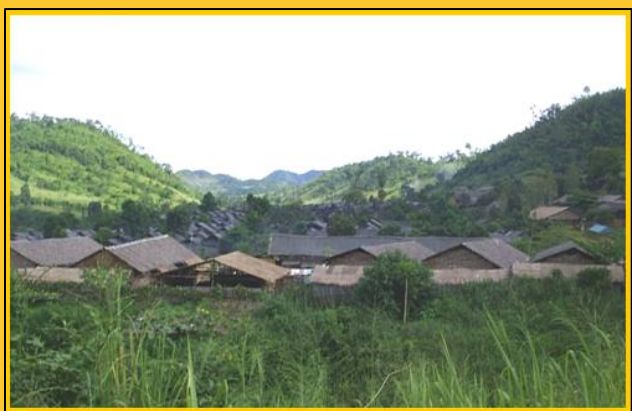


Environmental Health on the Thai-Burma Border

Response to the February 2007 Acute Water Diarrhea Outbreak in Tham Hin Refugee Camp



- ▣ Population 10,000
- ▣ Area 200,000 m²
- ▣ Living area 14 m²/person < SPHERE 45 m²/person

IRC Tham Hin Health Assistance Program



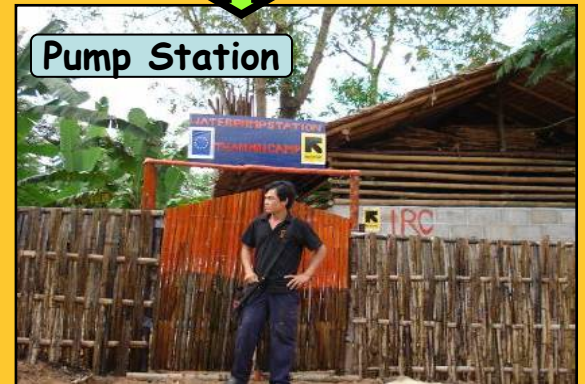
- # **Medical Health**
 Primary Medical Health Care, Vaccination, Reproductive Health, Health Information System, Pharmacy & Laboratory
- # **Community Health (CH)**
 Health Education, Hygiene Education, Hygiene Promotion, Home Visiting, Nutrition, Larva Survey and Avian Flue Prevention & Response
- # **Environmental Health (EH)**
 Water Supply, Fire Response, Latrine, Solids Waste Collection and Disposal, Vector Control, Crematorium, Rehabilitation & Hygiene Promotion With Community Health.



Water Supply Service



Upstream



Solids Waste Management

Wet Pits



Dry Waste Incinerators



Latrines



Crematorium



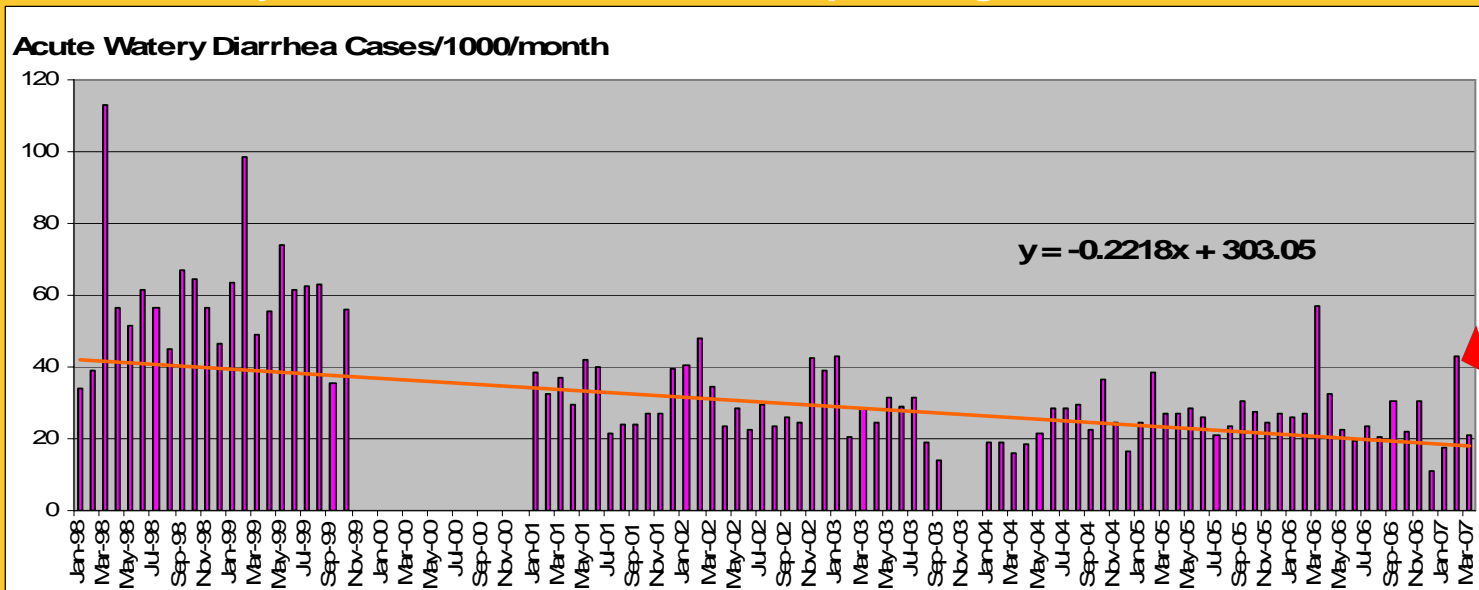
Vector Control



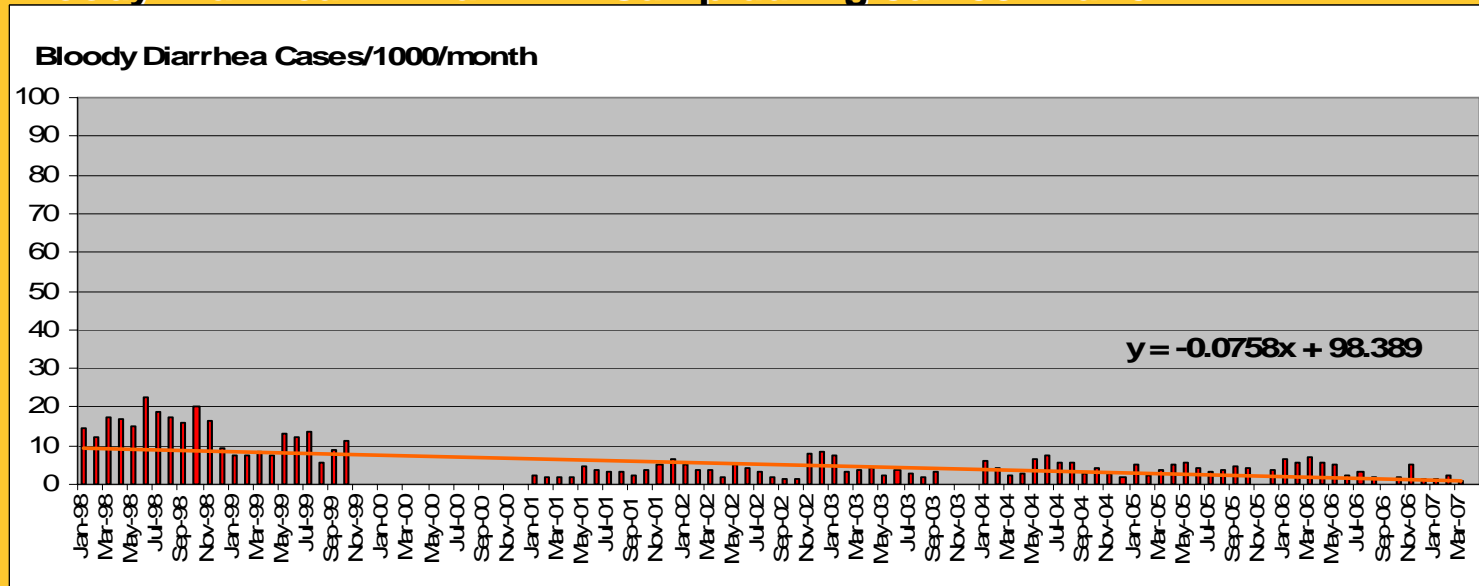
Hygiene Promotion



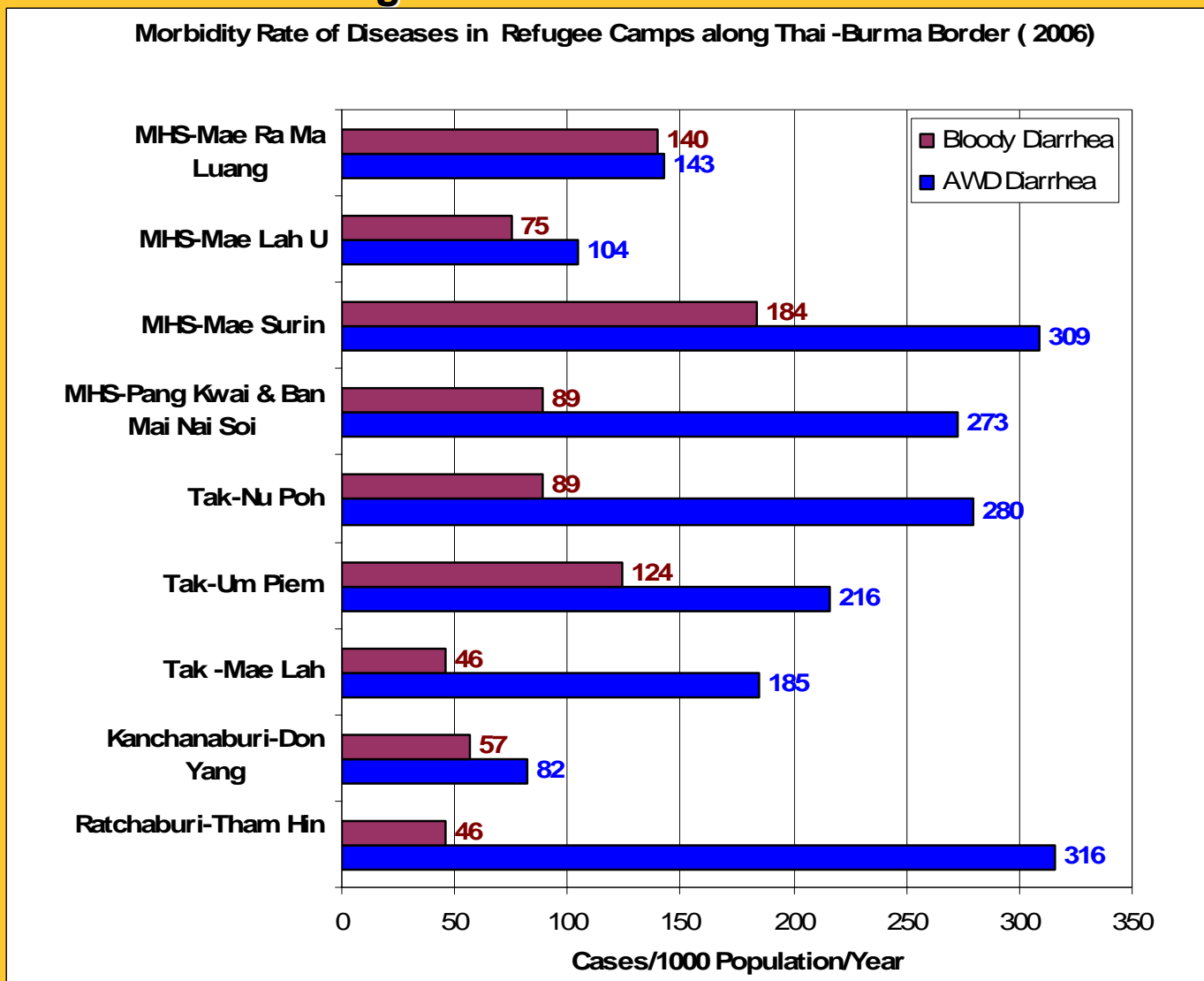
Acute Watery Diarrhea in Tham Hin Camp during Jan 98-Mar 07



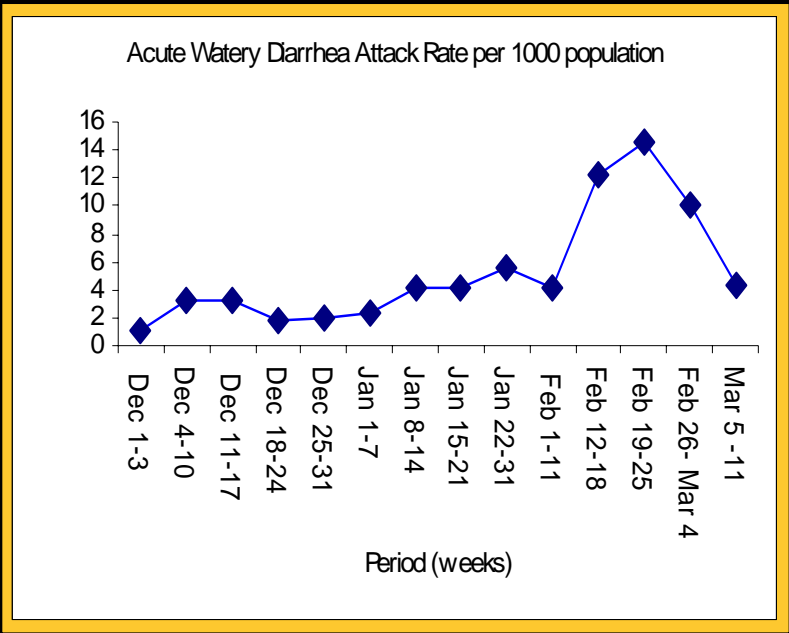
Bloody Diarrhea in Tham Hin Camp during Jan 98-Mar 07



Situation of Bloody and Acute Watery Diarrhea in Refugee Camps Along Thai-Burma Border in 2006



Outbreak investigation measures during the February 2007 acute watery 5 diarrhea outbreak in Tham Hin Camp



Date	< 5 YEAR OLD	> 5 YEAR OLD	TOTAL	Attack Rate (Cases /1000)	Compared to Base Line
WEEK # 1 Feb 1 st - 11 th	26 (70%)	11 (30%)	37	4	0.6
WEEK # 2 Feb 12 th - 18 th	67 (60%)	41 (40%)	108	12	1.7
WEEK # 3 Feb 19 th - 23 rd	81 (60%)	47 (40%)	128	14	2.0
WEEK # 4 Feb 26 th - Mar 4 th	48 (55%)	39 (45%)	87	10	1.4
WEEK # 5 Mar 5 th - 11 th			55	6	0.9

Main Symptoms of 20 IPD Patients

< 2 year olds:

- Vomiting & watery diarrhea
- Fever at admission
- No case with severe dehydration

- AWD Base Line = 62.5 Cases/Week, it is an indicator based on previous years average data.
- Alert Threshold =1.5 Times of Base Line



Rapid Response to Outbreak Detection

- Feb 16th : Soap distributed as part of regular program
- Feb 19th : **Outbreak Reported to CHW & EH**
- Feb 19th : Water safety testing & investigation by EH
- Feb 19th : Intensified community education & awareness raising by CH
- Feb 20th : Home visit of cases & health education by CH
- Feb 22nd : Laboratory support, screening for parasitic causes & stool sampling
- Feb 23rd : Announced on hand washing with soap & hygiene awareness 3 times a day

EH Investigations – Interview on Household Drinking Water Quality

CASE: MOTHERS OF IPD AWD PATIENTS < 2 YEAROLDS (19/2/2007)

SURVEY RESULTS PANEL	1	2	3	4	5	6	7	8
Drinking Water Collected Yesterday?	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap
Boil Drinking Water? (Y/N)	Y	Y	Y	Y	Y	Y	Sometimes	Y
HOUSEHOLD DRINKING WATER TESTING - PRESENT FEACAL COLIFORM/100 ML								
19/02/2007	0	0	23	39	0	0	0	0
20/02/2007	2	24	2	0	0	0	0	0



50% POST-CONTAMINATED



Presented > 0 Faecal Coliform Bacteria

CONTROL: RANDOM SAMPLING- NO AWD (22/02/07)

SURVEY RESULTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Drinking Water Collection Yesterday?	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap	Tap
Boil Drinking Water? (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
HOUSEHOLD DRINKING WATER TESTING - PRESENT FEACAL COLIFORM/100 ML														
22/02/2007	0	0	0	0	0	0	0	0	5	0	0	0	0	0



7% POST CONTAMINATED

→ **Response: Promotion of ADEQUATE boiling**



Water Supply Quality at Taps

	Free Residual Chlorine (mg/l)	Present of Faecal Coliform
Jan 2 nd	0.3-0.5	None
Jan 9 th	0.2-0.4	None
Jan 16 th	0.3-0.6	None
Jan 24 th	0.3-0.5	None
Feb 6 th	0.6	None
Feb 12 th	0.5-0.7	None
Feb 20 th	0.3-0.4	None
Mar 6 th	0.5-0.9	None
Mar 12 th	0.3-0.8	None
Mar 19 th	0.3-0.4	None
Mar 26 th	0.3-0.5	None

Drinking Water Quality at Households

- Jan 24th : 3 of 14 samples presented > 0 faecal coliform/100ml (All was boiled)
- Feb 22nd: 1 of 14 samples presented >0 faecal coliform /100ml (All was boiled)
- Mar 14th : 0 of 14 samples presented faecal coliform (All was boiled)

CASE: INTERVIEWING MOTHERS OF IPD AWD PATIENTS < 2 YEARS OLD (19/2/2007)

SURVEY RESULTS PANEL	1	2	3	4	5	6	7	8	9	10
1) After Defecation.	W	S	S	S	W	W	S	W	S	S
2) Before Food Preparation.	X	X	X	X	S	X	S	X	S	S
3) Before Eating.	W	W	W	W	W	W	W	X	W	W
4) Before breeding baby	W	W	W	W	W	W	W	X	W	W



Washed hands with soap



Washed hands with water only



Did not wash their hands

CONTROL: MOTHERS OF CHILDREN < UNDER 2 YEARS OLD WITH NO DIARRHEA DURING LAST TWO WEEKS (21/2/2007)

SURVEY RESULTS PANEL	1	2	3	4	5	6	7	8
1) After Defecation.	S	S	S	S	S	S	S	S
2) Before Food Preparation.	W	W	X	X	S	X	S	W
3) Before Eating.	W	S	S	S	S	S	W	W
4) Before breeding baby.	S	S	S	W	S	X	S	W

→ Response: Promotion of hand washing with soap



EH –Food Sampling

	Number of Samples	% of Samples Testing Positive for Faecal Coliforms	Source
Water in Babies' Bottles	3	33%	Households
Fermented Boiled Rice Flour in Noodle Form	3	33%	Shops
Fermented Sour Pork	2	100%	Shops
Ice	2	50%	Shops

CONTAMINATED IN FOOD

Clinical Laboratory Results

- None of 15 stool specimens presented cholera, shigella, salmonella species
- None of 13 stool samples presented parasites.
- Micro-organism caused the outbreak is unknown.

→ Promoted improved food hygiene to mothers and shop owners



Ongoing Monitoring

- Continue daily surveillance & case management
- Adequate stocks of ORS, antimicrobials & other supplies
- Community health education & health promotion
- Regular communication among IRC team members, including feedbacks to camp staff
- Joint investigation by clinical, community and EH using standardized guidelines.

