



PILOT STUDY ON THE EFFECT OF AN INTERVENTION USING *SODIUM DICHLOROISOCYANURATE* TABLETS (AQUATABS) FOR DRINKING WATER TREATMENT IN DHAKA, BANGLADESH

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OBJECTIVES

- To examine the practicability of motivating mothers to utilize Aquatabs disinfecting tablets for a significant period of time
- To examine the social, cultural and aesthetic acceptability of the Aquatabs chlorinated water
- To evaluate the success of chlorinated water in reducing water borne diseases (diarrhea etc.), specially among children under 5 years of age
- Investigate the feasibility of bringing about behavioral changes regarding use of drinking water





AQUATABS FOR DRINKING WATER TREATMENT

**Internationally recognized brand
of a water purification tablet**

Chemically: Sodium Dichloroisocyanurate (NaDCC)

**NaDCC dissociates in water
to release free available chlorine (HOCl)**



**Hypochlorous acid is universally recognized
as a safe and effective water disinfectant**





INTERNATIONAL USERS

- World Health Organization
- UNICEF
- Red Cross
- International Dispensary Association
- Oxfam
- World Vision





REASONS FOR SELECTING THE AREA



- **Densely populated area**
- **People do not practice any water purification at household or community level**
- **Close connection between drinking water and sewerage system**
- **Lack of knowledge among people about safety of drinking water due to illiteracy**
- **Wide occurrence of diarrhea among children under the age of 5**



*A pre-trial testing of water supply:
faecal coliform count > 10³ MPN/100 ml*





LALBAGH STUDY AREA



- **Area: 5.74 sq km**
- **Population: 365,323**
- **Households: 71,000**



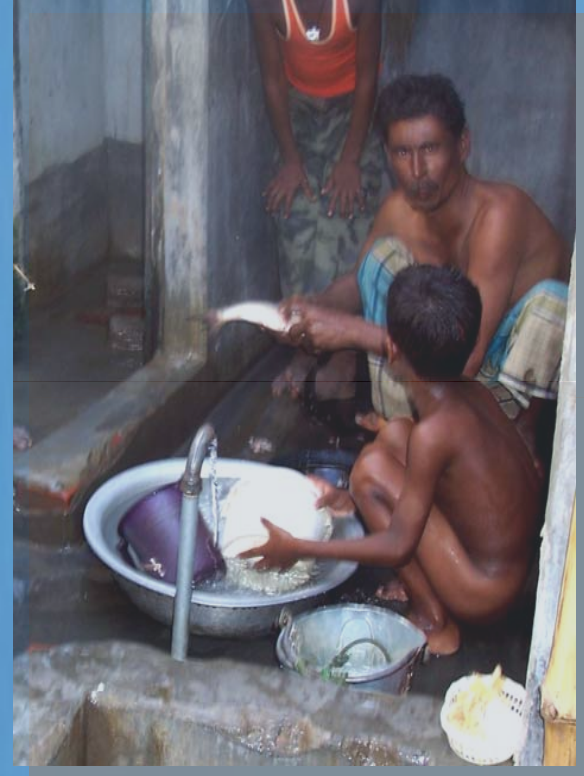
PARTICIPATION IN THE PILOT TRIAL

Period of 1 month:

Three 10-day periods

318 people in 50 households

70 children under 5 years of age



DATA COLLECTION



➤ Each household was visited once at 10 day period to observe dosage used and to collect water samples

➤ Laboratory tests were done for free residual chlorine level and presence of fecal coliforms

➤ Comments were added for under chlorination, over chlorination and correct chlorination

➤ All lab results at each 10-day period were compared

➤ The percentage of households which appreciated the use of Aquatabs for drinking water for their daily consumption was noted

➤ Diarrheal conditions in children were noted





TESTING

Fecal coliform detection:

Multiple tube fermentation technique

MPN method

Free residual chlorine detection:

Titrimetric method





DATA ANALYSIS

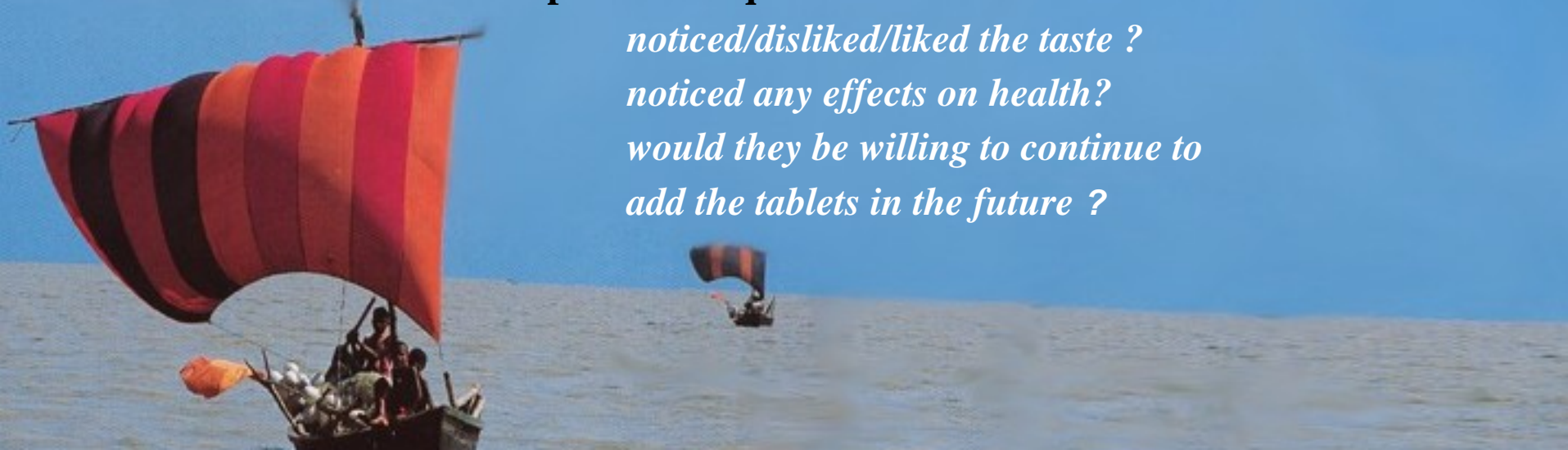
- Done for each 10-day period visit
- Bacterial levels in each household water for each 10-day period visit
- Reasons for non-compliance or family drop-out from the study
- Relationship between successful addition of Aquatabs and incidence of diarrhea
- Household's opinion of Aquatabs

noticed/disliked/liked the taste ?

noticed any effects on health?

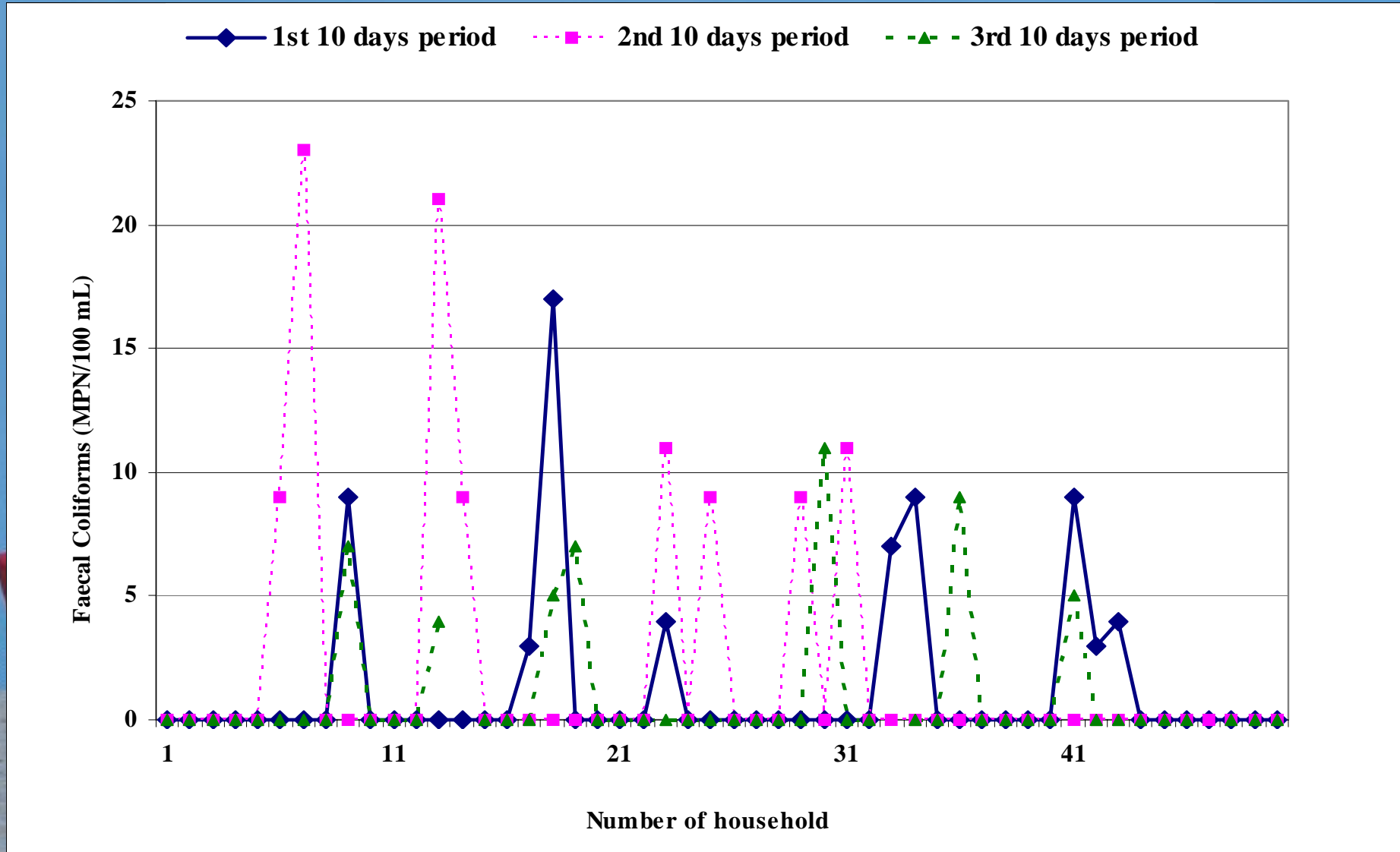
would they be willing to continue to

add the tablets in the future ?





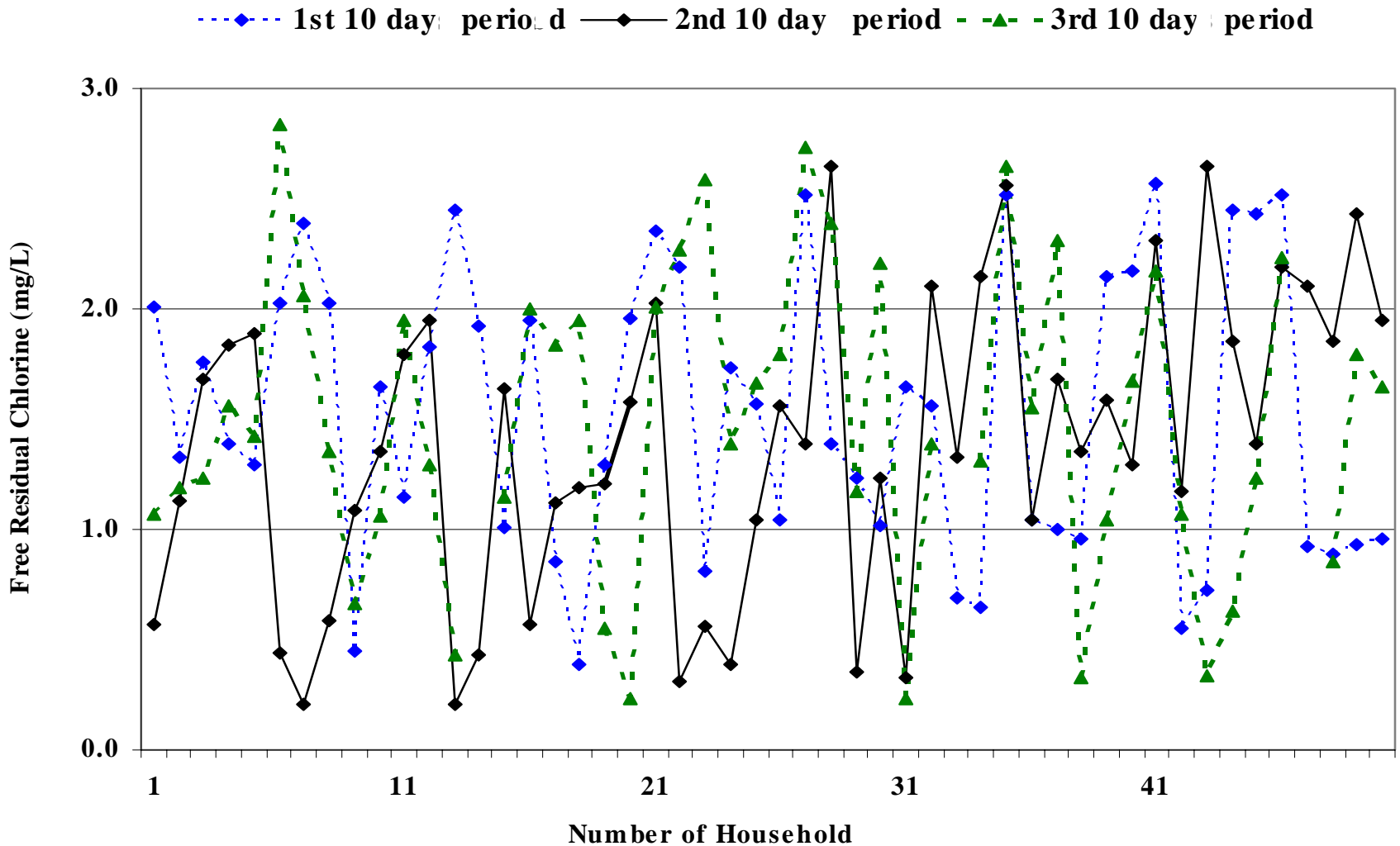
COMPARISON OF FECAL COLIFORMS IN HOUSEHOLD WATER





COMPARISON OF FREE RESIDUAL CHLORINE IN HOUSEHOLD WATER

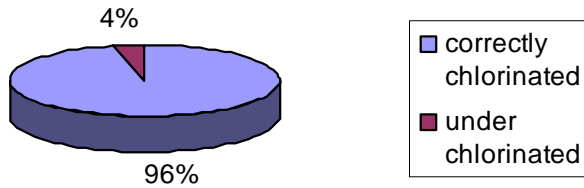
Chlorine in the range 0.2 – 2.8 mg/l for all households at all periods



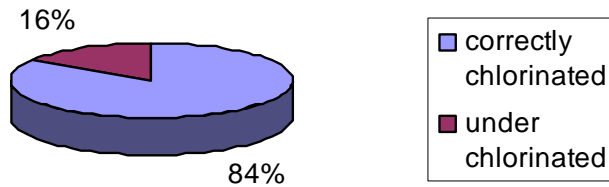


COMPARISON OF CHLORINATION EFFICIENCY IN ALL HOUSEHOLDS

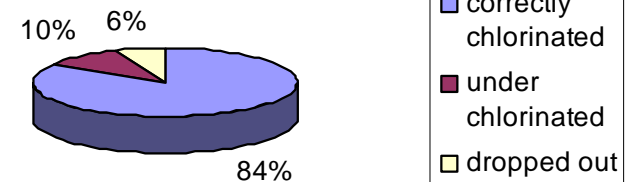
1st 10 day trial



2nd 10 day trial



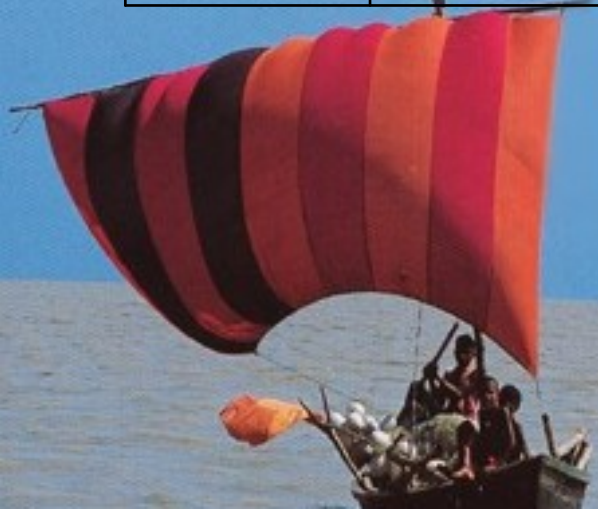
3rd 10 day trial



SUCCESSFUL REDUCTION OF DIARRHEA IN CHILDREN THROUGH AQUATABS CHLORINATION

Number of children under 5 years old	Diarrhea prior to using Aquatabs	DURING TRIAL			
		Negative diarrhea Group	Minor diarrhea Group	Severe diarrhea Group *	Percentage, %
14	Severe *		YES		20.0
46	Severe	YES			65.7
10	Severe			YES	14.3
<i>Total: 70</i>					100

* > 3 incidences of light diarrhea or
any serious diarrheal conditions per month





CONCLUSIONS

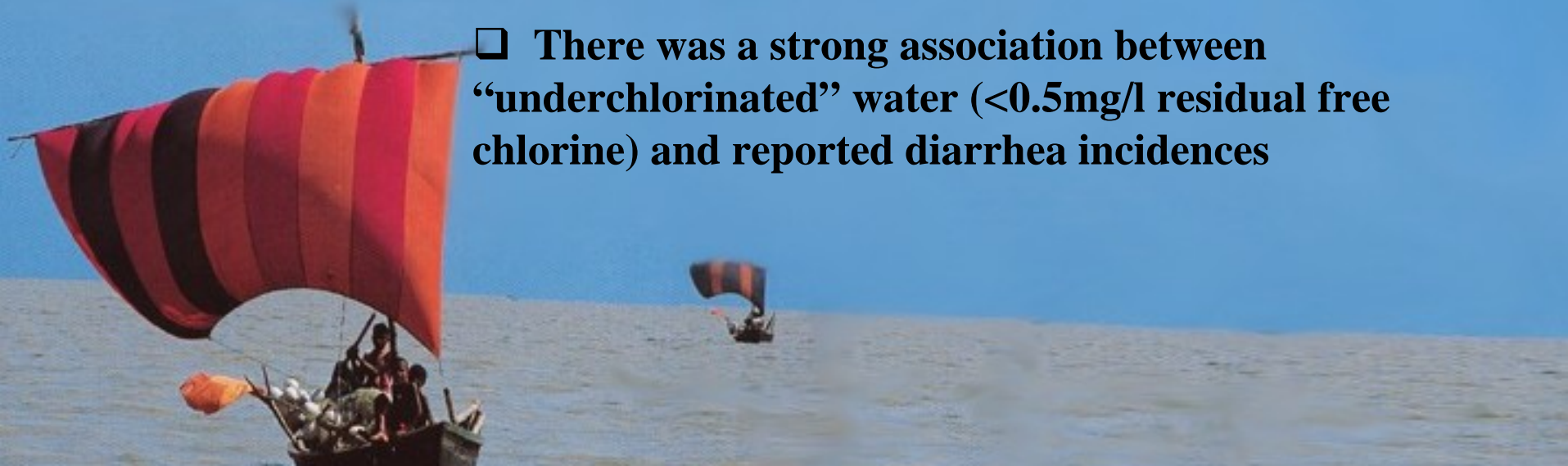
- **70% of mothers were not aware that health improvements were related to water supply and sanitation**





CONCLUSIONS

- ❑ There was a strong association between the absence of fecal coliforms and “correctly chlorinated” water samples (0.5mg/l - 5mg/l residual free chlorine)
- ❑ The diarrhea in children under 5 years of age was reduced from a pre-trial level of 100% in the “Severe Diarrhea Group” to 14.3% during the trial period
- ❑ 65.7% of children were reported to be free from diarrhea during the trial period
- ❑ There was a strong association between “underchlorinated” water (<0.5mg/l residual free chlorine) and reported diarrhea incidences





CONCLUSIONS

- **78% of mothers favoured the use of Aquatabs because**

They were easy and safe to use,

store and handle

They had no objectionable smell or taste

They dissolved quickly



- **It was easy to receive and give advice about their use at household level**





CONCLUSIONS

- Mothers subjectively appreciated a better and improved general physical state of their children towards the end of the trial period
- 65% of mothers expressed a future willingness to pay for Aquatabs, although the fathers were usually not willing to pay
- The general preference was for the Government or NGO to provide support





Thank You

