

ETHICAL REVIEW COMMITTEE, ICDDR,B.

Principal Investigator Dr. Bilqis Amin Haque Trainee Investigator (if any) NA

Application No. 90-003 Supporting Agency (if Non-ICDDR,B) _____

Title of Study Development of an appropriate handwashing technique. Project status: New Study Continuation with change No change (do not fill out rest of form)

Circle the appropriate answer to each of the following (If Not Applicable write NA).

- Source of Population:
- (a) Ill subjects Yes No
 - (b) Non-ill subjects Yes No
 - (c) Minors or persons under guardianship Yes No
- Does the study involve:
- (a) Physical risks to the subjects Yes No
 - (b) Social Risks Yes No
 - (c) Psychological risks to subjects Yes No
 - (d) Discomfort to subjects Yes No
 - (e) Invasion of privacy Yes No
 - (f) Disclosure of information damaging to subject or others Yes No
- Does the study involve:
- (a) Use of records, (hospital, medical, death, birth or other) Yes No
 - (b) Use of fetal tissue or abortus Yes No
 - (c) Use of organs or body fluids Yes No
- Are subjects clearly informed about:
- (a) Nature and purposes of study Yes No
 - (b) Procedures to be followed including alternatives used Yes No
 - (c) Physical risks Yes No
 - (d) Sensitive questions Yes No
 - (e) Benefits to be derived Yes No
 - (f) Right to refuse to participate or to withdraw from study Yes No
 - (g) Confidential handling of data Yes No
 - (h) Compensation &/or treatment where there are risks or privacy is involved in any particular procedure Yes No

- 5. Will signed consent form be required:
 - (a) From subjects Yes No
 - (b) From parent or guardian (if subjects are minors) Yes No
- 6. Will precautions be taken to protect anonymity of subjects Yes No
- 7. Check documents being submitted herewith to Committee:
 - ___ Umbrella proposal - Initially submit an overview (all other requirements will be submitted with individual studies). Protocol (Required)
 - ___ Abstract Summary (Required)
 - ___ Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw (Required)
 - ___ Informed consent form for subjects
 - ___ Informed consent form for parent or guardian
 - ___ Procedure for maintaining confidentiality
 - ___ Questionnaire or interview schedule *

- * If the final instrument is not completed prior to review, the following information should be included in the abstract summary:
1. A description of the areas to be covered in the questionnaire or interview which could be considered either sensitive or which would constitute an invasion of privacy.
 2. Examples of the type of specific questions to be asked in the sensitive areas.
 3. An indication as to when the questionnaire will be presented to the Cttee. for review.

(PTO)

I agree to obtain approval of the Ethical Review Committee for any changes involving the rights and welfare of subjects before making such change.

Bilqis Amin Haque
Principal Investigator

Trainee

1811/90

- (1) TITLE : Development of an appropriate handwashing technique
- (2) PRINCIPAL INVESTIGATOR : Dr. Bilqis Anin Hoque
- CO_INVESTIGATOR : Dr S. Islam
- ADVISOR : Dr D. Mahalanabis
- ANTHROPOLOGIST : Dr S. Zeitlyn
- (3) STRATING DATE : January 1990
- (4) COMPLETION DATE : November 1990
- (5) TOTAL DIRECT COST : U.S.\$ 23,772

(6) SCIENTIFIC PROGRAMME HEAD: Community Health Division

Signature of the Scientific Programme Head *Bilqis Anin Hoque*

1. OBJECTIVES AND RATIONALE

General Objective:

To develop an effective handwashing technique appropriate for the rural communities of Bangladesh.

Specific Objectives

1. To observe the handwashing techniques (different handwashing methods and use of various handwashing agents) of rural mothers following defecation.
2. To systematically develop an appropriate handwashing technique to minimize the fecal bacterial loads on the hands of rural women in Bangladesh.
3. To suggest guidelines for developing a personal hygiene-handwashing intervention study which may be undertaken in rural Bangladesh.

Rationale

Among the under-five-year children of Bangladesh diarrhoea is reported to be the major cause of mortality and morbidity but curative studies have been found to have limitations: oral rehydration therapy (ORT) has not been effective in reducing morbidity or in reducing mortality from persistent diarrhoea. (1,2) Antibiotic treatment of dysentery is limited by the difficulties encountered in providing treatment at the community level and by increasing bacterial resistance to antibiotics. (2,3) Hence diarrhoea prevention approaches need to be called upon and handwashing, which has reduced diarrhoeal diseases (1,4,5,6,7) and has potentials for being cost effective, demands immediate attention..

In countries like Bangladesh, where water is used for anal cleansing, people are in general unaware about the role of feces or sanitation in the transmission of diseases. Water and sanitation facilities are inadequate, people eat food by hand and diarrhoea morbidity and mortality rates are among the few highest ones of the world, it is obvious that handwashing will have several implications. No data is available on the level of hand contamination or on the effects of existing handwashing practices at real situation.

At community level wide variabilities in handwashing practices, behavioral to conceptual, have been reported from different parts of the developing world. (7,8,9,10) The water supply and sanitation programme of Bangladesh (10,11) and India (12) are found to promote the use ash as a handwashing agent when soap is not available. It is not known whether ash washing of hands is effective in the reduction of hand contamination or not or more precisely, what is the appropriate method for handwashing to reduce the bacterial load from hands at community level.

Although failure to wash the hands can promote the transmission of enteric pathogens, studies which claim reduction or removal of enteric pathogens from hands by washing with different reagents or by different techniques were almost all conducted in hospitals or clinical laboratories. (13,14) A study on the efficacy of wash agents in removing acquired organisms from the hands found five different hospital wash agents and water all equally effective when followed by drying on a paper towel (13). More than one of the clinical studies suggested that the scrubbing or rubbing of the hands was the main mechanism behind the removal of the organisms (13,14).

A small pilot study on the efficacy of the locally available and used wash agents, such as, mud, ash, soap and water found that under ideal study conditions all the three agents but water have more or less the same potentials to remove fecal coliform count from hands when rubbed for 10 seconds with the agents.(15) Each of washing agent (except soap) was sterilized prior to the test so that the potentials could be assessed under ideal conditions before moving to the complexity of naturalistic behaviours.

Studies on handwashing practices reveal that some religions and cultural credos, call for frequent handwashing, but these acts often are not perceived with hygienic needs and prescriptions, rather have both spiritual and physical dimensions (7,9).

In rural Bangladesh, soap is rarely used for handwashing purposes, it is costly and it is perceived more as a beautifying agent (9). In general hand is washed by water and in rural community about 90% of the people wash hand by mud and rinse it with water following defecation (10,11). Left hands are believed to be dirty and are usually left out of most of the activities since this hand is used for washing following defecation. This often leads to washing of the left hand separately from right hand.(12) For example, washing left hand following defecation and right hand before meals. But results of the hand cultures show the distinct possibility of contamination of food or the right hand (6).

Mud and ash both are used as wash agents or for various other domestic activities. Mud is used to put on protective layer at the bottom of the cooking utensils, for cleaning the cooking utensils and for smearing the mud floors. Ash washing of cooking utensils is common among the rural communities and it is sometime also used for washing cloths. But gradually the availability of ash is diminishing and it is less important in urban and semi-urban areas where gas cooking or fuel is becoming common.

Modification of behavioral practices is very complex and we need to be careful in developing the appropriate handwashing method by considering the actual observed practices. As hand anal cleansing has one of the highest likelihood for fecal hand contamination, we can base our handwashing study on this washing practice by observing the act for factors like handwashing agents, rubbing frequency of hands, washing of one hand versus two hands and length of time.

Justification

The proposed study is intended to identify the most suitable and cost-effective handwashing technique, appropriate to rural condition in Bangladesh. In order for a hygiene-education intervention concerning handwashing to be effective, the specific handwashing technique recommended should resemble current practices, using available appropriate materials.

Since the proposed research is expected to suggest guidelines for a hygiene-handwashing intervention study, it will facilitate undertaking of a follow-up community-based diarrhoea preventive study, which has potentials for diarrhoea reduction in the area.

2. EXPERIMENTAL DESIGN AND METHODOLOGY

A. Hypothesis:

1. Women in Bangladesh have their left hand contaminated with fecal bacteria from anal cleansing practice following defecation
2. The practiced handwashing techniques of the rural women following defecation are not adequate for reducing fecal hand contamination.
3. Information from observation of the usual handwashing practice of the women can be used for the development of an appropriate handwashing by experimentation and improvement.
4. The results of the study can provide specific guidelines for the design of a handwashing/hygiene intervention study for the prevention of diarrhoeal disease.

B. Study Area:

The study will be conducted in a village, located about 15 Km north of Dhaka. The area is representative of rural Bangladesh. The people are mostly dependent on open water sources for most of their domestic purposes, except for drinking when they collect water from tubewell. There is almost no sanitary latrine. There are about 90 households out of which 60 will be randomly selected for the study.

The area is well known to the P.I. The communication to the area is acceptable and the P.I. will be able to frequently visit the site at early morning hours of sample collection.

C. Sample size:

The pilot test on ideal handwashing method showed that 70% of the "no handwashed" sample (control) had one or more fecal coliform count and 20% of the hand-washed samples (mud, ash or soap) had one or more fecal coliform count. If we assume that similar level of contamination exists at community level and our target is to reduce the hand contamination to the 20% level of hand contamination we would need 16 samples in each of the control and washed group to compare the proportions at 90% test power and 5% significance level. Considering the 25% confounding possibilities we increase the sample size to 20 in each of the trial group and control group.

D. Components of the research:

This study will be carried out in two distinct series components:

- I. Observation of handwashing in the study community
- II. Experimental studies on the effects of different handwashing agents and techniques.

I. Observation of handwashing in the community (Phase I)

a. Aim of research step:

1. To know the actual handwashing practices including washing agents and techniques
2. To know if washing only one hand is advisable

b. Methods of data collection

Before beginning systematic direct observation of handwashing a focus group discussion will be conducted during the pre-test period of this phase (pre-test - I in plan). Data on main features of the community, pre-test of the interviewers, pre-test of the forms etc. will be done in pretest - I.

1. Sixty mother will be observed unannounced for normal handwashing practices following defecation and its effect on hand contamination. The observer will sit near the defecation site for approximately 3 hours during the early morning. Since the usual practice is to defecate in fixed site or bush, the women prefer to do the act in early hours when there is less people around.

2. A structured pretested observation from (Appendix I) will be used to collect the information on handwashing practice following defecation.

3. Hand contamination samples will be collected separately for each hand according to modified Pinfold method (16). Each women will immerse their each hand separately in 500 ml of sampling solution (1/4 strength Ringer's solution supplemented with 0.1% , v/v, Tween 20) , rubbing their fingers for approximately 10 seconds.

4. The collected samples will be transported to the laboratory within 4 hours, keeping the samples in a foam box with cool packs.

5. In the laboratory samples will be immediately processed for total coliform and fecal coliform estimation by standard membrane filtration techniques (17). One dilution will be made for each sample. The dilution factor will be determined during pre-test phase.

6. A semi-structured pre-tested interview will be conducted after defecation (Appendix I) to collect information on acts inside, the latrine.

7. Sixty trips will be made over 60 consecutive weekdays. Every day, at least one defecation site will be observed.

8. The observation part (Phase I) is planned to start in January and completed by early April. This period accounts for the highest diarrhoea rates avoiding the acute water shortage period.

9. Two months will be allowed for preliminary data analysis before undertaking the experimental part.

II. Experimental study (Phase II)

a. Aim of research step: -----

1. to determine the appropriate agent(s) for handwashing by which the positive fecal coliform count can be reduced to 20% of the samples;

2. to determine the appropriate techniques (wash-agent and method) for handwashing (e.g. one hand vs two hands, length of time of rubbing) by which using the same washing agent and maintaining the same level of achievements (bacterial reduction) the washing method be conveniently standardized.

b. Methods of data collection:

The experimental part of the study will be undertaken after field part of the observational study and its data analysis. This will allow for consideration of the actual relevant practice (from Phase I), such as, common washing agents, sources of washing agents, level of hand contamination one or both hands are contaminated and length for rubbing time.

To minimize the distribution of baseline - hand contamination data, the women will be asked to dip their hands in standardized cow-dung solution. The conditions of the solution will be set based on the results of phase-I and standardized during the pre-test (pre-test II) part of the second phase. This will allow inoculation of hands/hand with an approximately known number of coliforms prior to washing.

The experiment will move from the most common practice to the least common practice aiming to develop the appropriate handwashing practice.

The sequence of experiments presented in this section is based on information obtained in previous studies (10,15), it may need to be revised depending on the results of Phase I (observation part).

1. If as in the previous studies (9) most of the people used mud (which has ideally similar potential for reduction of bacterial contamination of hands as soap (14), as washing agents, the effectiveness of mud from usual community location will be assessed first by using it as a washing agent. The observational study will locate usual sources of mud and a maximum of 4 such different locations will be selected. The characteristics of the selected mud will be determined as described in 'f'.

2. The experimental study will be designed with 20 women in each group of washing agent and control (Table I). Each woman will inoculate their hands with approximately known and more or less similar concentration of bacteria (by dipping hands in the cowdung solution). Except the control women, each of the other sampled woman will be asked to wash her hand with the assigned washing agent. This handwash trial (treatment group) will be undertaken for 3/4 groups depending on the number of wash agent source to be tested. At the end of this trial 20 women will be available in each group of wash agents.

3. In the specified washing groups (treatment group) the women will wash their hands with the wash agent by rubbing both hands for approximately 10 seconds and rinsing them with locally available water. The control group will not wash their hands.

4. Each hand of the treatment groups and the control groups will be sampled in sampling solution and processed for the total coliform and fecal coliform estimation as mentioned in the data collection section of the observation phase (I.b.3-5).

6. The contamination level/characteristic of mud used for the washing will be assessed by determining, pH, moisture content, color, apparent texture, estimated total coliform count and estimated fecal coliform count of the mud (the counts will be done by spread plate technique) to characterise the mud from different sources.

7. If the results of mud trials are found unsatisfactory (not reduced to 20%), ash from different local sources will be used as wash agent and experimented as done for mud.

8. Following the identification of wash agent the handwashing technique will be experimented. If Phase I shows that only one hand is contaminated washing one hand vs two hands will be tried with the identified wash agent and 10 seconds of rubbing (similar design and handwash sampling but with 3 groups of women, two groups washing in two ways + 1 control group.) If two hands are found contaminated (from Phase-I), one hand vs, two hands will not be tried. All the trials for technique development will be then conducted

with two hands washing options.

9. Once the handwash agent and one vs two hands of rubbing is determined, the effective length of hand rubbing time in terms of approximate frequency of rubbing for 10 seconds, 5 seconds and 3 seconds will be experimented (similar design and handwash sampling with 3 washing groups and 1 control group as in Table 1) keeping the quality of the results to the same level.

10. The results of this experimental phase will be recorded as shown in Appendix II.

11. Four trips are required for testing mud as a washing agent, three trips to test one vs two-hand technique and four trips to test the length of rubbing time. Thus a minimum of 11 trips are required in the experimental part. However, if mud is found to be an inadequate agent the trial will need to be conducted with ash requiring four more trips.

12. Field trip will be made on alternate week days to fit the laboratory work. Therefore, this experimental part would require about two months.

E. Method Quantification

1. Personnel

Principal investigator will be responsible for the project activities. This will include scientific and administrative activities, such as , data collection, laboratory analysis, data analysis, report writing and overall supervision.

Co-investigator will help/advise the P.I. on microbiological part of the protocol, if required. He will also take care of the project in the absence of the P.I. However, the time involvement of the investigator will be not more than 5 % as shown in the budget.

Advisor will advise as needed but his main involvement is expected at data analysis and report writing phases.

Anthropologist will be consulted as required in different phases, such as, pre-test phases and report writing.

All the other project personnel will be hired as daily wagers to match with the requirements of the phases which are separated by a period of at least two months of data analysis/planning activities. Considering the privacy of the studied women and early hours of the job local women is required to do the data collection of the observation phase. However, local women will be trained and pre-tested. In the laboratory analysis P.I. will be helped by an assistant (also daily-based) who has done similar microbiological work. The assistant will also help the P.I. in data management by entering the data as soon as it is ready.

2. Sample quantification

1. It is estimated that we will obtain 120 samples hand wash samples (60

women* 2 hands) from observation phase. Therefore, we need 480 plates (total coliform + fecal coliform + 1 dilution= 4 times of each sample) for this estimation.

b. In the experimental phase we will have about 320 samples (120 different trials * 2 hands). Therefore, we need 1280 plates (total coliform + fecal coliform + 1 dilution= 4 times of the sample).

c. For soil tests and pre-tests of the method we may need another 100 plates.

d. In total we may need about 1800 plates.

e. Based on previous experiences of the P.I. it is estimated that about 1.5 U.S. dollar is needed for preparing each media. About 2700 U.S. dollar will be required and with 1.5 safety safety factor the total relevant cost amounts to about 4000 U.S. dollar.

F. Data management and Analysis

All data will be recorded in pre-coded forms and entered in personal computer on the last day of each week. A program reproducing the questionnaire on the screen and with filters to prevent entry of out of range values will be used. It is expected that the data will be ready for analysis immediately at the end of field study. Preliminary results of Phase-I (observational phase) will be sent to WHO for comments on certain plans to be undertaken during Phase-II (experimental phase).

All the analyses will be done using standard statistical programs. Some sample dummy tables from both phases are shown in Appendix III.

The guidelines for a following hygiene intervention study will be derived from the results, such, hand contamination level following defecation identified hand washing agent, handwashing techniques, contamination level of one vs two hands, contamination trend with available water sanitation facilities/methods etc. This will also help to draw the size required for the study. The experimental part will provide the intervention tool, that is the appropriate handwashing technique adoptable to the rural community and practicable following the significant hand contaminating act.

G. Plan of Action

It may be planned for twelve months as shown in Table 3.

Preliminary sensitization of the site, random selection of households, recruitment of staff and pre-testing of the questionnaire will be done by the P.I., in consultation with an anthropologist.

ABSTRACT SUMMARY (Ethical Review Committee)

Handwashing act is one of the suggested options for diarrhoea prevention. But at community level wide variabilities in handwashing practices, behavioral to conceptual, have been reported from different parts of the world. No data is available on the techniques of the different existing handwashing practices or on their effects on hand-contamination. Often handwashing of hands is promoted in the sub-continent without knowing its efficacy or improvement over other common practices.

This study aims to develop an appropriate handwashing technique at community level and to design a personal hygiene intervention study incorporating the developed handwashing method. The research is planned in two phases: (i) phase I, an observational part on different handwashing practices and, (ii) phase II, an experimental part to systematically develop an appropriate handwashing technique. Bacterial tests, such as total coliform and fecal coliform count, will be done on handwashed samples to test the effects of handwashing practices.

G. References

1. Feachem, R.G, (1986). Preventing diarrhoea: what are the policy options? Health Policy and Planning. 1 (2), 109-117
2. Fauveau, V., Yunus, Md., Zaman.K., et al., (1989). Epidemiologic Features of Childhood Diarrhoea. Under ICDDR,B review.
3. Koenig, M.A., Fauveau, V., Wojtyniak, B (1989). Potential reduction in infant and child mortality through immunization programs: Evidence from Matlab, Banglades. Under ICDDR,B review.
4. Feachem, R.G. (1984). Interventions for the control of diarrhoeal diseases in young children: promotion of personal and domestic hygiene. Bull WHO: 62, 567-76.
5. Black, R.E., Dykes, A.C., Anderson, K.E., et al (1981). Handwashing to prevent diarrhoea in daycare centres. Amer. J. of Epidemiology.
6. Moslemuddin Khan (1982). Interruption of shigellosis handwashing. Transactions of the Royal Society of Tropical Medicine and Hygiene:76(2).164-68
7. Clemsns, J.D. and Stanton, F(1987). An Educational-Intervention for Altering Water-Sanitation Behaviors to Reduce Childhood Diarrhea in Urban Bangladesh. I. Application of the Case-Control Method for Development of an Intervention. Amer. J. of Epid. 125 (1).
8. Aziz, K.M.A., Zahid Hasan K., Patwary Y., M. Mujibur Rahaman, Aziz K.M.S. (1983). A study of the Interpersonal Spread of Human Faeces in Rural Teknaf of Bangladesh. Proceedings of an International Conference. Shigellosis: A contanuing Global Problem. ICDDR,B, Bangladesh, Special Publication No.20, 238-49.
9. Zeitlyn S. and Islam F (1989). The meaning of soap and water in two Bangladeshi communities implications for the reduction of shigella transmission. (In press).
10. Aziz, K.M.A., Hoque, B.A., Huttly S.R.A., Minnatullah, K.M., Hasan, K.Z., et al. (1989). Water Supply, Sanitation and Hygiene Education:Report of a Health Impact Study in Mirzapur, Bangladesh (Draft).
11. International Centre for Diarrhoeal Disease Research, Bangladesh.(1985). Report of the Water and Sanitation Intervention Study: Teknaf, Bangladesh, 1980-1983.
12. Indu Bhushan (1989). Peraonal Communication. Project Director, Sanitation Water and Community Health Project, Rajasthan.
13. Knittle, M.A. et al (1975). Role of Hand Contamination of Personnel in the Epidemiology of Gram - negetive Nosocomisal Infections. J. of Pediatrics: 86, 433-37.
14. Sprunt, K. et al (1973). Antibacterial Effectiveness of Routine Handwashings. Pediatrics, 52, 264-71.

15. Hoque, B.A. and Briend A. (1989). Efficacy of Handwashing Agents in Ideal Condition of Handwashing Practice. ICDDR,B.
16. Pinfold, J.V., Horan N.J. and Mara, D.D. (1988). The Faecal Coliform Fingertip Count: A Potential Method for Evaluating the Effectiveness of Low Cost Water Supply and Sanitation Initiatives. J. of Tropical Medicine and HYgiene: 91, 67-70.
17. Standard Methods for the Examination of Water and Wastewaster. (1985). 16 th Edition. APHA. AWWA. WPCF

Table 1: Study design for experimental part

	Mud	Mud	Mud	Control	
Day 1	5	5	5	5	20
Day 2	5	5	5	5	20
Day 3	5	5	5	5	20
Day 4	5	5	5	5	20
	20	20	20	20	80

Table 2: Study design for testing one hand versus two hands rubbing

	One hand	Two hand	Control	
Day 1	7	7	6	20
Day 2	7	6	7	20
Day 3	6	7	7	20
	20	20	20	60

Budget summary

Budget Item	Year 1	Year 2	Year 3	Total US\$
Personnel	17772	NA	NA	17772
Operating expenditures	5500	NA	NA	550
Travel	500	NA	NA	500
Grand Total	23772	NA	NA	23772

1.1 Personnel

Category of Personnel	% of full time effort devoted to project	US \$
A. Professional scientific staff (functional title)		
1. P.I. and Env. Engr	100% (11 months)	15400
2. Co-investigator (microbiologist)	5% (11 months)	500
3. Adviser	As needed	0
B. Technical staff		
1. Health Worker	100% (5 months)	600
2. Lab. Help	100% (5 months)	700
C. Other staff		
1. Secretarial support	10% (11 months)	572
Sub-total		17772

1.2 Operating Expences

Budget Item	US\$
Chemicals for 800 samples	4000
Supplies: Office and Lab.	1500
Glasswares (from other project)	0
Sub-total	5500

1.3 Travel

75 trips to the community for sample ollection	500
Sub-total	500

CONSENT FORM

(Development of an appropriate handwashing technique)

International Centre for Diarrhoeal Disease Research, Bangladesh, is developing an appropriate technique for handwashing at common personal level. The handwashing will reduce bacterial contamination from hands. Since we aim to develop the method based on existing practices/convenience we need to have an idea on the real contamination levels, different handwashing practices and the effects of practiced handwashing on the level. Therefore, we like to observe the hadwashing practices following defecation and collect your handwash samples in normal saline solution. We had to select the post defecation act because it has the potential for highest contamination and satisfactory reduction of bacterial count at this point will ensure suitability of the method against any such contaminating act.

We will have to ask you questions on any handwash/clean related acts undertaken in the latrine. We hope that you understand the importance of such information for studying the effects of existing handwashing practices on bacterial concentration of hands.

If you are willing to agree to our request and contribute to a research which has wider implication for the prevention of diarrhoea, please sign.

P.I.

Signature of Participant

Date: _____

Appendix I: OBSERVATIONAL SURVEY

Part 1: Water-Sanitation

Name: _____

Sample Id. / / /
 vil pa hh ind

Age / /
 yr mo day

Drinking Water Source
(t.w.=1, pond=2, ditch=3,
river=4, others=5)

Distance to the source
(in approximate yards)

Cooking water source

Distance to the source

Bathing water source

Distance to the source

Latrine facilities:
(fixed=1, field=2, sanitary=3
courtyard=4, indiscriminate=4
N.A.)

adult
female
5 yrs

Date / /
 yr mo day

Part II: Observed Handwashing Act.

Time : /
 hr min

Date : / /
 yr mo day

Handwashing
(yes=1, no=2)

Washing agent
(yes=1, no=2, mud=1, ash=2,
soap=3, water=4, other=5)

Water used from
(pot=1, stored=2, direct source=3)

Source of agent

Washing method
(one hand=1, two hand=2)

Location of sample agent:

Rubbing frequency No. _____/

Description of the act:

Sample collected
(yes=1, no=2) _____/

Part III: Handwashing in Latrine:

Washed hand
(yes=1, no=2) _____/

Used agent
(water=1, mud=2, ash=3,
soap=4, other=5) _____/

Description of any washing:

Appendix 2: Phase II

Part I: Fecal Coliform Count

Sample Id. _____

Date : _____

yr

mo

day

Count from left hand _____

Method _____

Count from right hand _____

Method _____

Part II: Total Coliform Count

Count from left hand _____

Method _____

Count from right hand _____

Method _____

Part III: Characteristics of Agent

Type of agent _____

Apparent Texture of agent _____

Colour of agent _____

Moisture content _____

Total coliform count _____

Fecal coliform count _____

Source _____

pH _____

Appendix III: Examples of Dummy Table for Data Analysis

Phase I: Observation at Community

Table 1: Handwashing practices

Handwashing	Frequency	T. Coliform		F. Coliform	
		L	R	L	R
No Washing					
Washed with					
Mud					
Ash					
Water					
Soap					
Other					

Table 2: One Hand Vs Two Hand Washing

Acts
One hand washing
Two hand washing

Table 3: Hand Washing in Latrine

Acts inside	Acts outside	T. Coliform		F. Coliform	
		L	R	L	R
No. wash	No. wash				
	Washed with				
	mud				
	ash				
	water				
	soap				
	others				
Washed with					
mud					
ash					
water					
soap					
others					