

Principal Investigator ADAM Y. SLOTE Trainee Investigator (if any) _____
 Application No. 93-015 Supporting Agency (if Non-ICDDR,B) ICDDR,B & AKCHP
 Title of Study CHILDHOOD DEFECCATION IN THE SLUMS OF DHAKA 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).

1. Source of Population:
 - (a) Ill subjects Yes No
 - (b) Non-ill subjects Yes No
 - (c) Minors or persons under guardianship Yes No
2. 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
3. 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
4. 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 NA
 - (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 NA

5. Will signed consent form be required:
 - (a) From subjects Yes No
 - (b) From parent or guardian (if subjects are minors) Yes VERBAL No NO CONSENT
 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.

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

Adam Y. Srote
Principal Investigator

Trainee

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TITLE
Childhood Defecation in the Slums of Dhaka

STARTING DATE
Immediately upon approval

DATE OF COMPLETION
June, 1993

TOTAL BUDGET REQUESTED
US \$3,264

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ICDDR, AKCHP and PI's personal funds

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Childhood Defecation in the Slums of Dhaka

Proposal for a Pilot Study

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PROJECT OBJECTIVES

General Objective

To provide a comprehensive and detailed description of the knowledge, attitudes and practice by both children and their primary caretakers¹ regarding children's defecation in slum communities of Dhaka.

Specific Objectives

1. To describe maternal knowledge and attitudes concerning children's and adults' feces.
2. To describe the defecation practice of children 0-5 years of age, the practice of primary caretakers regarding disposal of their feces and the reasons for these practices.
3. To describe hygiene behavior directly related to children's defecation, including the methods used to clean² a child, clean a soiled floor or courtyard, wash soiled clothing and wash hands after cleaning children, as well as the location used to dispose of contaminated wash-water.
4. To describe knowledge, attitudes and practice regarding defecation by children 6-10 years of age as elicited in focus group discussions with those children..
5. To describe the reasons for use and non-use of latrines by children.
6. To describe the characteristics of children's defecation sites³ and the reasons for their use.

¹ A "primary caretaker" is defined by the study as any person, whether child or adult, who is principally responsible for the care of a child.

² When in reference to children, "cleaning" refers to cleaning the anus of a child following defecation.

³ A "defecation site" is defined by the study as any location to which children go for the purpose of defecation.

7. To describe the characteristics of feces disposal sites¹ and the reasons for their use.
8. To assess the need for further research in the area of children's defecation, as well as the usefulness of specific methods of collecting data of this nature.

HYPOTHESES

1. Children are more likely to use latrines at an earlier age when they are female, when they are trained to use the latrine and when those latrines are easy to use, well-lit, clean, private, close to home and shared by fewer households.
2. Children are more likely to defecate outside the house, on a specific material, such as paper or plastic, and at a defecation site when they are trained to do so.
3. Defecation sites are chosen on the basis of identifiable criteria, such as distance from home, degree of cleanliness and degree of privacy.
4. Feces disposal sites are chosen on the basis of identifiable criteria, such as distance from home and the frequency of cleaning.
5. Primary caretakers are more likely to wash their hands after cleaning their children and dispose of their children's feces, wash soiled clothing, clean a soiled floor or courtyard and dispose of contaminated wash-water in a prompt and sanitary fashion when they believe that children's feces are dirty or harmful and when they have received more formal and/or hygiene education.
6. Many of the practices mentioned above are significantly different on Fridays, when more children and adults (including working mothers) are at home.

¹ A "feces disposal site" is defined by the study as any location used by caretakers for the purpose of disposing of children's feces.

SIGNIFICANCE

Children's defecation, including beliefs and practices associated with it, is a topic that has received little attention in the literature. Whatever the reason, this neglect would not appear to be due to a lack of importance of the issue. UNICEF has stressed the need for research into this area (28) and ICDDR,B itself has indirectly alluded to the problem in its 1990-1994 Strategic Plan, in which it states that research priorities for the Community Health Division include "... behavioural and anthropological studies to understand the distribution, causes and risk factors for maternal and child deaths" (16). The need for such studies was more fully articulated at a recent workshop organized by ICDDR,B in Comilla entitled, "Water and Sanitation Priorities for the 1990's," at which sanitation experts from around the world agreed that research priorities in sanitation include the following:

Study of current beliefs and practices of people with regard to children's and adults' feces and defecation habits.

Investigation of appropriate technological options for safe disposal of children's feces (17).

Once enteric pathogens contaminate the environment, their elimination becomes exceedingly difficult (5). Efforts to control their spread are therefore best targeted towards "primary barriers" such as the sanitary disposal of feces and handwashing following defecation. Regarding defecation by children, this argument takes on a special significance. Because children constitute the age group with the highest diarrhea prevalence, they are also probably the most abundant source of enteric pathogens in the community. Ironically, their feces are also the least likely to be disposed of properly. Unfortunately, children are also the group most likely to come into contact with those feces, either accidentally or purposely, and the group at greatest risk for acquiring diarrhea and suffering from its complications. Interrupting the cycle of transmission would therefore be expected to constitute a major area of research. As far as the behavior of primary caretakers is concerned, it already is. Nonetheless, few studies have explicitly examined children's defecatory behavior (7, 12) and none have ever attempted to assess their beliefs or attitudes regarding defecation. While the term "indiscriminate defecation" is often employed when describing where young children defecate, it is clear that we know very little about where ambulatory children defecate,

why they defecate there and where infants' and toddlers' feces are disposed of and why they are disposed of there. A unique feature of the proposed study is that it will focus almost exclusively on children themselves, through both observation and focus group discussions.

Consistent with the lack of information on most aspects of children's defecation, there is little documentation of attempts to change children's behavior (21, 25) and none of attempts to develop "child-friendly" technology; that is, technology appropriate to the special needs of children. With regard to interventions aimed at primary caretakers, most have focused on handwashing and few have targeted other behaviors constituting the "primary barrier." In order to develop such interventions, both qualitative and quantitative information is needed regarding the ways in which children's feces enter the environment. Such information is particularly needed with regard to the urban slum environment. Not only does the high density of children compound the effect of each sanitary indiscretion, but the unique constraints of the city environment to a certain extent preclude the use of lessons learned in rural areas.

BACKGROUND

Morbidity and mortality from infectious diarrhea and morbidity from fecally-transmitted helminthic infections remain among the primary public health priorities of developing countries. Diarrhea itself is responsible for the death each year of nearly 5 million children under 5 years of age in the developing world (excluding China), where in this age group there are, on average, 220 diarrheal episodes and 1.4 deaths from diarrhea per 100 children every year (10). Efforts to control fecally-transmitted infectious diseases, particularly diarrhea, have been ongoing and have focused on the following interventions:

- 1) Case management, including oral rehydration therapy, non-oral rehydration therapy, appropriate feeding and chemotherapy.
- 2) Increasing host resistance to infection and/or illness and/or death, including maternal nutrition, child nutrition, immunization and chemoprophylaxis.
- 3) Reducing transmission of the pathogenic agents of diarrheal diseases, including water supply and excreta disposal, personal and domestic hygiene, food hygiene, control of zoonotic reservoirs and fly control.
- 4) Controlling and/or preventing diarrhea epidemics through epidemic surveillance, investigation and control (10).

Of particular interest to the current study is the literature on interventions related to excreta disposal and personal and domestic hygiene.

The literature is replete with studies documenting the association between sanitary facilities and hygiene behavior on the one hand, and diarrheal morbidity on the other. A now-classic study by Koopman showed that unhygienic toilet conditions in schools in Cali, Colombia resulted in a 44% increase in diarrhea prevalence compared to schools with clean toilets (19). Another study by Henry and Rahim showed that diarrhea incidence was lower among children who lived in a better sanitary area and was significantly correlated with the degree of contamination of the children's hands (13). A number of studies have also revealed an association between hygiene behavior and diarrhea. Authors have, for instance, identified unsanitary disposal of young children's feces (4), presence of feces in the family compound (6, 12), going about without footwear (12) and failure to wear clothes over diapers (29) as risk factors for diarrhea. A

study by Clemens and Stanton in Dhaka found that children with a high incidence of diarrhea were more likely than children with no diarrhea to come from households with a toddler who was observed to defecate in the family living area or a child who was observed to place garbage or feces in their mouth (7). Finally, while not yet published, it should be mentioned that two studies by Bilqis Amin Hoque, et al. at ICDDR,B are currently examining the association between sanitary facilities and hygiene behavior and *Shigella* dysentery in Dhaka in one study (14), and diarrheal mortality in Matlab in the other (15).

A large number of intervention studies are also documented in the literature, some involving hygiene education alone and others bundling hygiene education with the introduction of improved sanitary facilities. Torun in Guatemala found that education was successful in changing 19 of 27 target hygiene behaviors and that most of the remaining behaviors remained unchanged due to economic constraints of the families (27). Stanton and Clemens in Dhaka found that hygiene education aimed at three key behaviors known to be associated with increased risk of diarrhea was successful in lowering diarrheal incidence among children of those communities (25). Feachem, in an exhaustive review, concluded that hygiene education can improve hygiene and reduce diarrhea morbidity rates by 14-48% (11). Several large-scale studies have looked at the effects of introducing hygiene education coupled with appropriate hardware. Alam, et al. showed that in Teknaf, intervention with handpumps and education stressing use of handpump water for drinking and washing, removal of children's feces from the yard and maternal handwashing after defecation and before food preparation was successful in reducing diarrheal incidence (1). Aziz, et al. in Mirzapur found a 25% reduction in diarrheal incidence after introduction of handpumps, latrines and hygiene education stressing the need for both adults and children to use sanitary latrines (3). Both Esrey, et al. (8) and Esrey and Habicht (9) concluded after a comprehensive review of the literature that improved water supply, excreta disposal and hygiene education, especially in combination, was an effective means of reducing diarrhea morbidity rates, sometimes by as much as 50%.

Several essays have established the importance of and need for further behavioral research in preventing diarrhea (20, 22). A handful of studies have employed anthropological techniques, specifically on-site, direct observation, to collect data on the transmission of diarrhea. One by Aziz, et al. in Teknaf looked at the movement of mothers' hands throughout the day and identified a large variety of potential routes of

direct and indirect transmission of fecal matter (2). Another by Stanton and Clemens in Dhaka demonstrated a correlation between unhygienic use of a mother's sari and the incidence of diarrhea in her children (24). Of particular note is a brief essay by Isely discussing the merits of targeting sanitary interventions at children themselves, and hygiene education towards their primary caretakers (18). In it, he mentions the defecatory habits of young children and notes some of the reasons for their non-use of adult latrines. The paper is substantially weakened by its lack of supporting data, but it is significant for being the only one that could be located that discusses these topics in such detail.

Finally, of particular interest to the current study is a manuscript in preparation by Siddiqi, et al. discussing the results of a survey on water and sanitation recently completed in the same slums the current study will examine (23). Mothers from every slum household in the Aga Khan catchment area were interviewed (a total of 2131). The results showed that 99.9% use tap water for drinking, 48% use an open latrine for defecation, 22% a sewer-connected latrine, 16% a septic tank-connected latrine, 11% a pit latrine¹, 2.3% a dug hole² and 1% have no fixed site. 4% do not share their latrine, 30% share with 1-9 families, 55% with 10-49 families and 10% with ≥ 50 families. Payment is required for use of all types of latrine except the "no fixed site" category, ranging from a low of 29% of open latrines to a high of 86% of septic tank-connected latrines. 15% of children under 5 years of age use a latrine for defecation, 25% use paper or a plastic bag, 22% the side of the house, 17% a drain, 11% the bed or a cloth, 2% a road and 6% defecate indiscriminately. While the latter set of data is unique, and for that reason alone quite valuable, it should be stressed that the information was collected by questionnaire only and that questionnaires have been found to be unreliable when compared to on-site, direct observation of sanitation behavior. For instance, a study by Stanton, et al. found a very poor correlation between KAP and 24-hour recall questionnaires and on-site observation of sanitation practices in Dhaka (27). This is one of the gaps that the current study was designed to fill.

¹ A "pit latrine" is defined by AKCHP as a water-seal latrine with a cement platform atop a ring-lined pit.

² A "dug hole" is defined by AKCHP as a non-water-seal latrine with a platform of varying materials atop an unlined pit.

RESEARCH PLAN

Data Instrument Development

Data will be collected by observation, interview and inspection. From a review of the literature, informal observations and discussions, a preliminary list of observation, interview and inspection items has been prepared and is included in the Appendix. These instruments will be further refined through focus group discussions with AKCHP field supervisors, community health workers and slum mothers, key informant interviews and unstructured observations. During the process of field-training (mentioned below), the data forms will be pretested and modified to develop the final data instruments. All three sets of instruments will be precoded.

Research Officer Training

Six female field research officers (FROs) with at least university degrees and with research experience in the slums, and one field supervisor (FS) will be hired. The FS will most likely come from AKCHP's current staff of supervisors, all of whom have extensive experience in the type of research involved in the current protocol. Using a manual describing the objectives of the protocol, guidelines for interacting with the study participants (stressing the importance of building rapport) and details for filling in the data sheets, the FROs and FS will be trained for one to two days in the classroom by the principle investigator and a Bangladeshi assistant. After satisfactory completion of this stage, training will move to the field, where the FROs and FS will practice interviewing, observing and inspecting households located in a slum not involved in the study, for a minimum of four days. Inter-observer reliability checks will also be made at this time and training will continue until agreement on 80-90% of the variables between each of the FROs is reached.

Data Collection

Observations. Two sets of continuous monitoring observations will be conducted: one focusing on children who typically stay near their home and primary caretaker (approximately 0 – 1.5 years of age), the other focusing on children who consistently stray far from the immediate family area (approximately 1.5 – 5 years of age). Both sets will take place on each of the five weekdays and on Friday, from 0700-1200.

Preliminary observations indicate that most families wake up at about 0700, that morning is the most common time for children to defecate and that after about 1230 mothers are often busy preparing lunch and have little patience for the post-observation interview (see below). Both sets of observations are primarily event-driven; that is, rather than document an entire day's activity, they will record activity surrounding individual defecation episodes. Both sets are also person-based; that is, they will focus on specific actors rather than specific locations. For the younger age group, the FROs will usually be able to sit in or just outside the house. However, if the primary caretaker leaves the home and the child follows or is taken along, the FRO will follow the study child. For the older age group, the FROs will usually be on the move, following the child at a distance of 10-20 meters. At this distance, they should be able to easily identify when defecation takes place and move in closer if the situation permits. For both sets of observations, the FROs will introduce themselves and obtain consent several days in advance. The consent form is included in the Appendix. The observations themselves will take place unannounced and their exact purpose will not be disclosed, to discourage changes in behavior. The FROs will be instructed to behave naturally to put their subjects at ease, to fill out their data form immediately after an episode of defecation to avoid changes in behavior during the episode and to leave if their presence is felt to be causing excessive discomfort. Periodic spot checks will be made to verify that the FROs are at their posts at the appropriate times. A total of 72 children 0 – 1.5 and 72 children 1.5 – 5 years of age will be observed, 12 of each on Fridays.

Interviews. Two sets of interviews will be conducted: one immediately following the observations, the other one week later. The post-observation interviews are designed to illuminate the reasons behind some of the behaviors witnessed during the observation period. They will be conducted by the FRO performing the observation. The interviews one week later are designed to assess knowledge and attitudes regarding children's defecation, as well as key practices hopefully also seen during the observation period,

so that the two may be compared. They will be conducted by an FRO unfamiliar with the results of the observation. Both sets of interviews will be conducted with the study child's primary caretaker, whether child or adult, inasmuch as it is their knowledge, attitudes and practice that influence the study child and not necessarily the mothers'. In the study area, 20-50% of mothers are reported to be employed outside the home. In these homes, of the children under 5 years of age, a large number are primarily cared for during the day by an older sibling. Methods of interviewing them successfully will be stressed during the training period. All interviews will be conducted in Bangla.

Focus groups discussions. In addition to the above interviews, focus group discussions will be conducted with children 6-10 years of age. The purpose of these discussions will be to examine the knowledge, attitudes and practice of this age group regarding defecation, elicit the reasons behind their decision to start using latrines and to prepare the groundwork for future studies with this age group. Groups of 5-10 children will be rounded up from among the study households and neighboring households and will be asked a series of structured and unstructured questions. Answers will be recorded in both a precoded and verbatim format. The exact method of conducting these discussions is yet to be determined and will require extensive field-testing. One FRO will conduct the discussion while another will record the responses. All of the focus groups will take place on Fridays, to include those children who go to school. A total of 12 focus group discussions will be conducted.

Inspections. Three sets of inspections will be conducted: one of latrines, one of defecation sites and one of feces disposal sites. The primary objective of these inspections is to uncover the reasons for their use and non-use by children for defecation in the case of the first two, and the reasons for their use by caretakers for the disposal of children's feces in the latter case. The latrines will be assessed for their inherent characteristics, such as type, ease of use and interior light level, as well as their transient characteristics, such as cleanliness and smell. The defecation sites will be assessed for such characteristics as type (eg., drain, ledge, field, river bank), degree of privacy, ease of use and cleanliness. The feces disposal sites will be assessed on such things as ease of contact with the feces and type (eg., dustbin, edge of road, hole). For all three, FROs will be encouraged to record free-form comments on why they think that particular site was chosen. In addition, for all three, their approximate distance to the study households will also be measured. This will be done by counting the number of intervening strides. Each FRO will be assessed individually for stride length by

having her step off 10 strides 5 times consecutively and averaging the distances. Each FRO's approximate level of accuracy will then be assessed by marking off a predetermined distance and having the FRO step off the distance. This test will be repeated once midway through the study.

Case studies. In addition to the above information, case studies will also be prepared to discuss in more depth and in greater breadth the overall situation regarding children's defecation in the slums of Dhaka. The goal is to provide a contextual basis from which we may appreciate the nature of the problem and its many subtleties. The households for the case studies will be identified by the FROs as being particularly typical or interesting situations with especially verbal household members. Methods of data collection will include in-depth interviews, detailed inspection of the environment, mapping and photography.

Sampling Procedure

Study population. The Aga Khan Community Health Program's surveillance population consists of 5231 households¹ residing in Wards 60 and 62 of Motijheel thana in Dhaka. Of these, 2130 are considered slum households as defined by the Center for Urban Studies². These households are distributed among 59 separate slum areas, ranging in size from about 20 to about 150 households. Most of the slums are located on privately owned land, their tenants paying varying amounts in rent. Less than 10% are squatter settlements on government-owned land. Most of the residents work in the labor and service sectors in such jobs as rickshaw puller, construction worker, vendor, garment worker and maid servant. 95% are Muslim, the majority have no formal schooling and most live at or slightly above the subsistence level. On a demographic level, the slums in Wards 60 and 62 seem to be fairly representative of slums elsewhere in Dhaka.

¹ A "household" is defined by AKCHP as a group of individuals living together under the same roof and sharing the same cooking pot.

² A "slum" is defined by CUS as "authorized and unauthorized areas and communities of very high area density (over 300 persons per acre), as well as high room crowding (3 or more adults in a room) and poor housing (generally shacks, kutcha structures, semi-pucca flimsy structures or very old dilapidated buildings). The areas have inadequate water supply, poor sewerage and drainage facilities, little paved streets and lanes and irregular clearance of garbage. Bastees (slums) are inhabited by very poor and poor people who are mostly engaged in various types of informal sector activities."

Surveillance of these areas by AKCHP has been ongoing since 1988 and includes the following elements: demographics (pregnancy, birth, death, marriage, education, occupation, etc.), service indicators (ARI, diarrhea, EPI, nightblindness), ante- and postnatal care, ORS usage and vitamin A capsule distribution. Two data sets important to the current study – socioeconomic status and sanitation – are collected at the baseline only.

Sample size. It should be stressed that the proposed study is a descriptive study, whose emphasis is on qualitative rather than quantitative data analysis. It was designed to be small and well-focused and to serve as a pilot for larger studies to come. In addition, due to limitations on the PI's time and budget, the data will be collected intensively over a rather short time period. As a result, it should be acknowledged early on that the sample size has been influenced by a number of logistic as well as scientific concerns.

While a number of interesting and unexpected results are expected to arise from the study, one outcome variable of particular importance is the use and non-use of latrines by children. If nothing else, it would be desirable to state with confidence the prevalence of latrine usage by young children. The sample size for the age group 1.5-5 years of age was therefore calculated with this goal in mind. AKCHP recently completed a survey which found that 15% of children 0-5 years of age use a latrine (8). Of these, children 0-1.5 years of age, because of their preambulatory nature, are unable to use a latrine. Thus, of those with the potential ability to use a latrine (those approximately 1.5-5 years of age), about 20% might be expected to do so. Using this proportion, the estimated sample size required to achieve an absolute precision of 0.10 with a confidence level of 90% is 43 children 1.5-5 years of age. Assuming that only 60% of the children in the study will actually be observed defecating, a minimum of 72 children 1.5-5 years of age would be required for the study.

The study is also interested in the behavior of children 0-1.5 years of age. For this age group, it would be desirable to state with confidence the prevalence of sanitary disposal of their feces by their primary caretakers. Informal observation indicates that only about 30% of caretakers dispose of children's feces in a way that does not contaminate the environment. Using this proportion, the estimated sample size required to achieve an absolute precision of 0.10 with a confidence level of 90% is 57 children 0-1.5 years of age. Because of their largely preambulatory nature and the greater frequency with

which this age group defecates, it is assumed that about 80% will be observed defecating, again requiring a minimum of 72 children 0-1.5 years of age.

In summary, the estimated sample sizes required for the two age groups are as follows:

Children 0-1.5 years of age: 72

Children 1.5-5 years of age: 72

Total children 0-5 years of age: 144

The breakdown for the number of Friday observations was based entirely on logistical limitations, as was the determination of the number of children's focus groups to be conducted. Inspections will be performed of all the latrines and defecation sites available to the household of a study child or the child him or herself, up to a maximum of 3 each. The number of case studies performed will be determined during the course of the study.

Selection. Children will be randomly selected from among AKCHP's complete listing of slum households by stratifying on the basis of age. 86 children (72 plus 20% for refusal) 0-1.5 years of age and 86 children (72 plus 20% for refusal) 1.5-5 years of age, for a total of 172 children, will be approached by the FROs for participation in the study. The first 72 children in each age group whose mother or head of the household gives consent will be enrolled in the study. In the unlikely event that two children from the same age group or one each from the two different age groups are selected from the same household, the second one selected will be passed over and another will be selected in his or her place, such that only one child will be selected from any one household.

Data Entry and Management

FROs will be debriefed and their data sheets reviewed daily for the duration of the study. Data entry onto a Macintosh personal computer using the software program Microsoft Excel will begin immediately and will be performed by the PI. The entire database will be manually checked for entry errors and cleaned using range and consistency checks before analysis is begun.

Analysis

The data will be analyzed by the PI using the software program SPSS for Windows on an IBM-compatible personal computer. Data analysis will be primarily qualitative and descriptive in nature, but wherever possible will employ quantitative analysis as well. Univariate analysis will include simple frequency distributions, bivariate analysis will include cross-tabulations, chi-squares and Fisher's exact test and multivariate analysis will include logistic regression. Common confounders, including SES, maternal and paternal education, water supply and age and sex of the index child will be controlled for. The unit of analysis will be both the individual child and the household as a whole. Emphasis on the former will permit investigation of the influence of such variables as age, sex and number of siblings on children's defecation behavior and their caretakers' responses. Emphasis on the latter will allow the development of behavioral scales at the household level. Such scales could be created on the basis of "sanitary" versus "unsanitary" behavior and analyzed for associations on the household level, such as parental education, active hygiene education of the children by the parents, beliefs concerning the harmfulness of children's feces and beliefs regarding the causes of diarrhea. Sample dummy tables are included in the Appendix.

Sources of Bias

Potential sources of bias include the following:

1. A sanitation intervention has already been made in the study area and may prevent generalization of the study's findings to other slum areas of Dhaka. In January of 1992, AKCHP inaugurated a health education curriculum targeted towards mothers and older children in slum areas of Wards 60 and 62. The community health workers rotate through eight different topics of instruction, including one on water and sanitation. So far, only one cycle on water and sanitation has taken place. The messages covered included the following:
 - a. Like adults' feces, children's feces also spread disease. Children and adults should therefore both use a latrine.
 - b. If there is no latrine, make a hole in the ground, put the feces in the hole and cover it with earth

- c. Wash your hands thoroughly with soap or ash after defecating.
- d. Keep drains and open spaces near the latrine clean.

Informal observation by several of the field supervisors has indicated that few of their messages have been successful. In particular, children appear to be defecating in the open with the same frequency with which they did in the past. Although approximately 8 months will have elapsed between the time of the educational intervention and the start of the study, AKCHP's households can not be considered pristine and may exhibit better sanitary behavior than the average slum household. The study will address this potential bias in two ways. First, the purpose and specific items of the observations will not be disclosed. Behaviors which have been learned, but which have not become a part of a family's normal routine, will therefore be less likely to appear. Second, interviewees will be asked in an open-ended format which, if any, sanitation messages they have received. Such a question may aid in assessing the impact of AKCHP's educational messages on the study's findings. Last, it should be noted that there are probably very few "pristine" slums left in Dhaka. It would appear that most have at one time or another received some form of education on sanitation and personal hygiene. Should this be true, the education AKCHP's slums received may only have served to make them representative of Dhaka's slums in general.

- 2. Children and their primary caretakers may alter their behavior as a result of the FRO's presence. This is a risk that every observational study takes, but attempts to minimize it will include the following: 1) children and their caretakers will not be informed of the hypotheses or exact objectives of the study, 2) observations will commence without immediate warning, 3) the data forms will be filled out only after the defecation episode has occurred, 4) the FRO will attempt to establish good rapport with the study subjects, putting them at ease, 5) defecating, children will be observed from a discrete distance and 6) latrine and defecation site inspections will take place after the observations.
- 3. The household and defecation site observations may be biased towards the behavior of children with diarrhea, inasmuch as they are the ones most likely to defecate at any given time. The study will attempt to control for this in several ways. First, the FROs will attempt to record stool consistency, so that obvious

episodes of diarrhea can be identified and controlled for. Second, primary caretakers will be asked if the child has had diarrhea in the past 24 hours, to identify likely cases of diarrhea. Third, if a child defecates more than once during the observation period, his or her data will be analyzed separately and included in the larger analysis only after being shown not to differ significantly from the larger group.

4. The time-frame of the proposed study will not include any part of the rainy season. The findings will therefore be biased towards behaviors that occur in the hot, dry season. It seems likely that as water becomes more plentiful and covers sites popular for defecation, behaviors such as anal cleaning, handwashing and latrine use will change considerably. Limitations on the PI's time, however, prevent extension of the study into the rainy season and thus this data will unavoidably be lost.
5. A potential limitation of the study is bias on the part of the FROs. For several reasons, however, such bias is unlikely to appear. First, the research officers will be unaware of the study's hypotheses. Second, they will be carefully trained and evaluated for reliability before entering the field. Third, they will be filling out detailed, largely precoded forms. And fourth, they will be debriefed on a daily basis and retrained as necessary.

ETHICAL IMPLICATIONS

This study will rely solely on observation, interview and inspection for data collection. No invasive techniques will be employed. While several of the interview questions and observation items may touch on uncomfortable subjects, e.g., defecation, none are expected to cause significant emotional hardship. Verbal, informed consent will be sought from all study participants and, in the case of children, from their primary caretaker or the head of the household. All information collected will remain strictly confidential: records will be kept anonymously on computer and documents linking the records to specific identities will be kept in a locked file cabinet.

Childhood Defecation in the Slums of Dhaka

– Abstract –

Despite significant progress, diarrhea remains a significant cause of under-5 morbidity and mortality in Bangladesh. An important reason for this is continued fecal contamination of the environment, especially by children's feces. Intervention is clearly needed, with both appropriate technology and appropriate hygiene education. At the moment, however, we do not possess sufficient information to determine what is and is not appropriate. That, therefore, is the ultimate aim of the current study: to describe the situation surrounding childhood defecation – specifically as it occurs in the slums of Dhaka – in the hope of targeting technological and educational resources more accurately. The immediate aim of the study is, however, more modest: inasmuch as it is a pilot study, the focus will be on identifying areas for further study and testing the feasibility of specific methods of data collection.

72 children 0-1.5 years of age and 72 children 1.5-5 years of age from slum communities of Motijheel thana will be enrolled in the study. Each child and his or her caretaker will be observed for one day from 7 am to 1 pm by a trained field worker. Following the observation, the worker will briefly interview the caretaker about the reasons behind some of the behaviors witnessed during the course of the observation. Following this post-observation interview, the worker will make three sets of inspections: one of latrines available to household members, one of defecation sites used by the study child and one of feces disposal sites used by the child's caretaker. One week later, a different field worker will conduct a more in-depth interview with the caretaker. In order to assess the knowledge, attitudes and practice of older children as well, 12 focus group discussions will be conducted with children 6-10 years of age. Field workers will be debriefed on a daily basis and retrained as needed. Data entry will begin immediately. Data analysis will be primarily qualitative in nature.

Most of the ethical issues involved in the study have been discussed in the proposal or are not applicable. However, a few points deserve emphasis. Specifically,

1. Participation in the study involves virtually no risks for the study subjects – physical, psychological, social, legal or otherwise.
2. Strict confidentiality will be maintained at all times and the procedures for doing so have been described.
3. Informed, signed consent will be obtained from authorized legal guardians or parents of the children enrolled in the study.
4. The information collected during this study will be used to improve AKCHP's existing hygiene education program and thus will directly benefit those children and their families involved in the study, as well as those who are not. The benefits to accrue to society in general will depend on how the results of the study are used by other researchers and program managers.

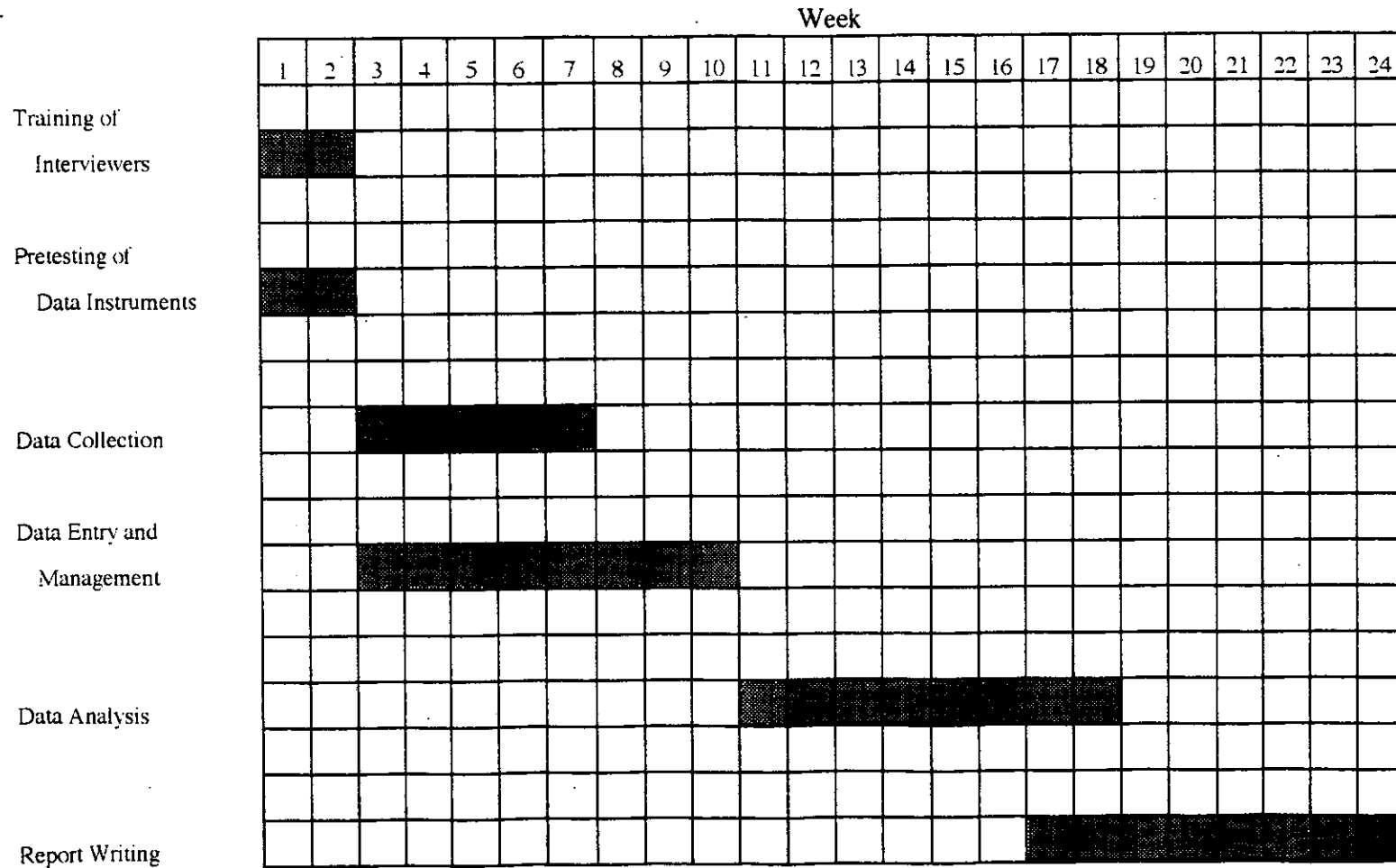
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FLOW CHART



BUDGET

Personnel: Tk. 92,000

- Field research officers
Tk. 2000/person/week
X 6 weeks = Tk. 12,000/person/study period
X 6 persons = Tk. 72,000/study period
- Field supervisor
Tk. 2000/week
X 6 weeks = Tk. 12,000/study period
- Assistant investigator
Tk. 2000/week
X 4 weeks = Tk. 8000/partial study period

Travel: Tk. 10,080

- Tk. 10/person/rickshaw ride
X 4 rides/day = Tk. 40/person/day
X 7 persons = Tk. 280/day
X 36 days = Tk. 10,080/study period

Operating costs: Tk. 4000

- Photocopying: Tk. 1000
- Computer disks: Tk. 1000
- Miscellaneous: Tk. 2000

SUBTOTAL: Tk. 106,080
plus 20% AKCHIP overhead

TOTAL: Tk. 127,296 (US \$3,264)

(NOTE: This figure does not include any salary for the PI or Co-investigator, who are working without pay)

APPENDIX

It should be stressed that the interview, observation and inspection items listed in the Appendix are of a preliminary nature only and do not necessarily represent the actual items to be used in the field.

SAMPLE DUMMY TABLES

% Using Latrine	Latrine Condition					
	Latrine Private	Latrine Not Private	Feces Inside	No Feces Inside	No Smell	Foul Smell
Male						
Female						

% Using Latrine	Latrine Type		Number of HH Sharing			
	Ground-level	Hanging	None	1-9	10-49	≥50
Male						
Female						

Avg Age 1st Use	Latrine Type		Number of HH Sharing			
	Ground-level	Hanging	None	1-9	10-49	≥50
Male						
Female						

Location of Feces Disposal	Age (months)	
	0-6 (breast-feeding)	≥7(solid foods)
Garbage		
Road		
Drain		
Field		
Bathing area		
Latrine		

Location of Defecation	Age (months)			
	0-8 (Stationary)	8-15 (Crawling)	15-24 (Toddler)	24-60 (Independent)
Cloth				
Paper				
Plastic				
Mat				
Potty				
Floor				
Courtyard				
Drain				
Road				
Field				
Bathing area				
Special site				
Latrine				

Reasons For Not Using Latrine	Latrine Type	
	Ground-level	Hanging
Not necessary		
Don't know how		
Not safe		
Too difficult		
Afraid		
Too far		
Too crowded		
Dirty		
Too costly		

Latrine Use By Children	Maternal Hygiene Education		Distance: House to Latrine	
	Some	None	≤ 10 meters	> 10 meters
Latrine Used				
Latrine Not Used				

Reasons For Not Using Latrine	Number of HH Sharing			
	None	1-9	10-49	≥50
Too far				
Too crowded				
Dirty				

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Sandra Laston
Amatul Uzma
Sushila Zeitlyn

Consent Form

My name is _____. I am working at the Aga Khan Community Health Programme, helping with a study looking at the health of children in this community. We are doing this study because we hope that one day the results may lead to changes that will help improve the health of children in the slums. If you agree to be in this study, some time in the next couple of days I will come back to watch your children as they go about their daily activities. I'll stay from about 7 am to 12 noon. About one week from now, another study assistant will come back to ask you some questions on the health of your children, for about 30 minutes. Some of these questions may touch on some personal issues, but most of them are simply about what you and your children do during a normal day. All of the information collected will be kept strictly confidential. There are no risks for you or your children. We would be very grateful if you would agree to be in this study, but you are completely free to say no. Even if you agree to be in the study, you may change your mind at any time for any reason.

(To be administered verbally, in Bangla)

আম্মার নাম _____ । আম্মি আম্মার জ্ঞান কম্বিউনিটি ছেনম্ম
 প্রদ্যাম্ম কাজ করি। এই প্রোফেসর শিষ্টদের স্বাধু্য যম্মকীয় ওকর্গী
 গায়েম্মাম্ম আম্মি আম্মা জ্ঞানকে আম্মম্ম করছি। আম্মরা এই
 গায়েম্মা করছি কারণ আম্মাদের বিশ্বাম্ম এই গায়েম্মা মোকে
 পাশ্চম্মা মল্লম্মেণ্ডা ওবিম্মেণ্ডা এ যম্মি-প্রোফেসর শিষ্টদের স্বাধু্য
 উন্নতিত আম্মম্ম করবে। আম্মিনি যদি এই গায়েম্মাম্ম
 অক্কা প্রম্মেণ্ডা অম্মম্ম থাকেন তবে আম্মি আম্মাম্মী-দিনম্মম্মো
 কিছু অম্মম্মের জম্ম আম্মনার বম্মীত আম্মো এবং আম্মনার
 শিষ্টদের দিকে নজর রাখবে মাম্ম জারু আম্মের স্বাভাবিক
 জীবন মম্মম্ম চাচিলম্মে মম্মে। আম্মি-আম্মনার বম্মাম্ম
 মম্মেণ্ডা ওকর্গী মোকে ম্মম্মের ওকর্গী পর্ম্ম মম্মেণ্ডা। এর ওকর্গী
 মম্মাম্ম পার আম্মারি ম্মে আম্মেণ্ডা ওকর্গী জম্ম আম্মে আম্মনার
 আম্মনার বম্মম্ম স্বাধু্য-মম্মম্মম্ম-কিছু-প্রম্ম করায় মম্ম
 আম্মনার ওকর্গী মম্মিষ্টের ম্মে মম্মম্ম মোবে। কিছু কিছু প্রম্ম
 আম্মনার ব্যক্তিগত বম্মম্মেণ্ডা ম্মে মম্মে। কিছু অম্মিষ্টম্ম
 প্রম্মম্ম অম্মম্ম অম্মম্মেণ্ডা মম্মম্ম, আম্মিনি এবং আম্মনার বম্মম্ম
 মম্মম্ম দিন কি করে মম্মম্ম করম্ম।

আম্মনার মম্মম্ম জম্ম ওম্মম্মেণ্ডা আম্মনা হবে। ওকর্গী
 মম্মম্ম জম্ম আম্মনার বা আম্মনার শিষ্টের জম্ম আম্মে
 মম্মম্ম জম্মক নম্ম, আম্মিনি যদি এই গায়েম্মাম্ম আম্মম্মম্ম
 মম্মম্মম্মেণ্ডা মম্মম্মম্মিষ্ট মম্মে তবে আম্মরা আম্মনার প্রতি অম্মম্ম
 মম্মম্ম মম্মেণ্ডা। আম্মনার পূর্ন অম্মিকার আম্ম "না" বম্মার
 আম্মিনি মম্মম্মিষ্ট দাের পম্মেণ্ডা গায়েম্মা ওকর্গী মম্মেণ্ডা মম্মেণ্ডা মম্মে
 মম্মেণ্ডা আম্মনার মম্মম্মিষ্ট না থাকেন আম্মিনি আম্মনার মম্মে
 মম্মিষ্টম্মেণ্ডা মম্মেণ্ডা পারেন।

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