

E-Conference on Safe Excreta Disposal Network July 17-August 31, 2001

Safe Excreta Disposal – Summary Report Chris McGahey May Post Dan Campbell Environmental Health Project

Introduction and Sub-topic 1: Definition of Safe Excreta Disposal

Dear Network Subscribers:

Welcome to the Information Exchange Network.

The EHP Information Center will serve as the moderator for the forum which will have a time frame of four weeks. As you all know, the topic for the discussion is: "Proper Excreta Disposal and its Impact on Diarrhea Prevention in Children Under 5." We plan to organize our discussions around different sub-topics. We will discuss each sub-topic for a few days and then move on to another sub-topic.

Our first sub-topic for discussion relates to the definition of proper excreta disposal--what we all understand by proper excreta disposal. This appears to be a logical topic to start off our discussions.

Other anticipated sub-topics are as follows:

- Barriers to proper excreta disposal
- Programmatic approaches for the sanitary disposal of children's excreta
- What's been done in Operations research/literature
- Gaps and next steps.

However, based on the direction the discussions take, we will amend the sub-topics as necessary.

We have a great group of experts and I hope and expect that we will be able to generate stimulating and useful ideas and information.

Below we have our first discussant. Have a look at what he has to say and send in your thoughts, ideas, comments.

The Moderator
EHP Information Center

Introduction to Sub-topic 1: Definition

As an "information exchange", the goal is to exchange information about current knowledge and needs so that we all can plan, implement, monitor, and evaluate field programs which promote proper excreta

disposal. The definition of "Children under the age of 5" is, I hope, quite clear. But what is the definition of "proper excreta disposal"?

"Proper excreta disposal" is mentioned repeatedly in literature, conferences, and discussions as key to improving health status, environmental conditions, and the quality of life in developing countries. These are wide ranging impacts to be expected from the act of disposing of one's excreta. However, disposing of excreta in latrines HAS been shown to reduce diarrhea by a very significant 30% or more.

We propose that "proper excreta disposal" be defined as any action which removes human excreta and the pathogens it contains from further human contact. This emphasizes the health impact of the action and places environmental and quality of life concerns on a secondary level of attention. As an initial action for this group, let's resolve this definition. Do you agree with it? If yes, why? Do you not agree with it? If not, why not and what alternative definition would you propose?

We hope to resolve this definition by the end of Thursday of this week, Washington DC time. Then we will move on to further sub-topics described above.

Thank you for your participation,

Chris McGahey, Ph.D.
Coordinator
Community-based Environmental Sanitation and Hygiene
USAID Environmental Health Project (EHP)

Brandt Witte, Water and Sanitation Specialist, Peace Corps:

Sub-topic 1: Definition

Hello Dr. McGahey,

I like your definition of "proper excreta disposal". However, since some forms of latrine (sealed composting or dehydrating) promote the idea of humans handling the excreta after a certain period of time, it is important to be clear on when the pathogens found in these latrines are no longer harmful to humans.

Brandt Witte, Water and Sanitation Specialist

Vicky Blagbrough, Hygiene Promotion Adviser, WaterAid:

Sub-topic 1: Definition

Dear Chris

I would be happy to agree with the proposed definition for "proper excreta disposal" if it could embrace Brandt Witte's point that safe disposal is about preventing human contact with pathogens, rather than the excreta itself.

I do have a question, though. Is there a particular reason for choosing the word "proper" rather than "safe"? I'm wondering if it could cause needless complications when translating into other languages, particularly non-European ones.

Eckhard Kleinau, Senior Technical Director, EHP:

Sub-topic 1: Definition

Dear Colleagues,

We had some interesting comments about the definition of proper excreta disposal. Introducing the concept of "safe" disposal that prevents human contact with pathogens transmitted through feces has sharpened the discussion. I would like to introduce the field perspective and propose a "practical" definition for "safe" feces disposal, because in communities there exist only a limited number of options of how to get rid of excrements. These options vary between cultures and countries. Some options may allow "safe" disposal, but others may not, and there may not exist total consensus about how to classify different means. In household surveys, for example the DHS (USAID/MACRO) or MICS (UNICEF), definitions of an "adequate" sanitation facility that allows the "safe" disposal have changed over the years, and there is more agreement today, but other surveys may employ very different interpretations. How much agreement is there of what constitutes "safe" feces disposal among this group? Here are some suggestions (taken from earlier work on indicators):

- Safe disposal of feces indicates that feces are disposed of in a way that reduces the risk of contaminating the household environment with pathogens significantly. Safe - or sanitary - disposal means either defecating or throwing feces in a latrine or toilet. These are considered the only safe means.
- By definition, households without a "sanitary" latrine or toilet facility cannot dispose of feces safely.
- A sanitary latrine or toilet that allows the safe disposal of feces includes only the following types:
 - flush toilet with connection to a public sewer
 - flush toilet with connection to septic system
 - pour-flush latrine
 - simple pit latrine
 - ventilated improved latrine
- Safe disposal of feces requires a private latrine (one facility per family). Whatever the type, it must have an appropriate superstructure, at minimum an enclosure that bars views into the latrine, to be considered sanitary. Latrines without a minimal superstructure discourage use. Households that use public latrines or toilets are not classified as disposing stools safely, because of a lack to control sanitary conditions and the higher risk of contamination. Similarly, private facilities shared among households might not be considered safe for the same reasons. Shared facilities may discourage use because of unhygienic conditions and for cultural reasons.
- Not considered safe or sanitary are:
 - Bucket latrines and similar types that require the manual removal of untreated or not composted feces. The risk of contaminating the immediate environment may be considerable.
 - Burying feces. While this could be safe theoretically, this does not seem to be a practical or sustainable solution. It would be very difficult to verify during a household assessment.
 - How should we classify composting or dry latrines (ecological sanitation) that have been introduced in some projects?
 - Under certain circumstances safe disposal may happen by intermediary of a "potty" or diaper, but whether these are truly safe depends on where the feces end up and remains to be defined.

- Are all feces equally important? Where are the short comings? Should this behavior focus on children (young, older), adults, caretakers of children, food preparers, or all of the above?

This is an attempt to clarify some of the issues. These definitions may be too stringent or experience may exist that would argue for different definitions. I hope the ensuing discussions will help us to advance and reach some working definition for "safe" feces disposal.

Wim van der Hoek, Theme Leader Water, Health & Environment, International Water Management Institute:

Sub-topic 1: Definition

I agree with the definition suggested but of course no definition can be perfect. For example in sewerred urban areas human excreta and the pathogens might be removed from further contact with the people who produced the fecal material, but the story does not end there. In many cities the untreated sewage is reused for agriculture or aquaculture and the sewage farmers are of course in direct contact with the fecal material that others have "disposed properly".

Summary of Subtopic 1: Definition of Safe Excreta Disposal

Dear Network Subscribers:

I appreciate your input and ideas which you have contributed during the past three days. Suggested improvements have been incorporated into a revised definition of the focus of our discussion, and some questions have been raised which have been addressed outside of the Information Exchange Network.

On this latter point, I would like to take a moment to inform all Subscribers that the Environmental Health Project has among its many mandates one related to information dissemination regarding all aspects of environmental health including vector management, community based programs, water supply, sanitation, and hygiene in rural and urban areas. I encourage each of you to contact Dan Campbell of our office (campbelldb@ehproject.org) with any specific questions we might assist you with. For example, the question raised in the Network regarding technical aspects of rural latrines was addressed directly to the sender by Dan. I also encourage each of you to visit our website at <http://www.ehproject.org/> where a range of technical and programmatic information is available for review and downloading.

Finally, based on the dialogue, we propose an amended definition from that originally presented. Please accept the following as our functional definition to allow us to proceed with the discussion:

"Safe excreta disposal is any action which removes the pathogens contained in human excreta from further human contact at any time in the future."

We feel that this accounts for the well-considered comments received regarding (1) emphasizing the contact with pathogens and knowing confidently when these are no longer present, (2) using the more direct word "safe" in place of "proper", and (3) considering the distant effects of off-site disposal.

You have stimulated healthy thought among the Network managers here at the Environmental Health Project, and I look forward to continuing the dialogue over the coming weeks and the variety of sub-topics.

Sincerely,

Chris McGahey, Ph.D.

Introduction to Sub-topic 2: Barriers to Safe Excreta Disposal

Dear Network Subscribers:

We have wrapped up our first sub-topic related to the definition of safe excreta disposal and a summary of the discussion has been sent out. If however, you missed our deadline and have an issue you would like to discuss related to the definition, please feel free to write to us.

- We will now move on to the second sub-topic: "Barriers to safe excreta disposal."
- What are the barriers to safe excreta disposal?
- How can we overcome the barriers?
- What are the interventions required?

If you have information related to this topic, we invite you to write into us and share your information, ideas and experiences.

The time frame for this discussion will be three days (till close of business Tuesday, August 14)

The Moderator

EHP Information Center

Remember: Safe excreta disposal is any action which removes the pathogens contained in human excreta from further human contact at any time in the future.

Diarrhea is the second most important killer of children under the age of 5. Although there is clear evidence of reduction of mortality caused by childhood diarrhea in recent years - thanks to better treatment of the disease using oral rehydration salts - existing information suggest that to further impact morbidity and mortality related to diarrhea, programs must focus on promoting prevention of diarrhea along with treatment. Safe excreta disposal has been clearly shown to be a key to diarrhea prevention, but expanding safe disposal will involve overcoming a wide range of obstacles. These obstacles, or barriers, will be the focus of our discussion for the next few days. Then we will try to make progress on documenting programmatic initiatives which have successfully addressed these barriers.

We have seen the hazards created by unsafe disposal of the feces of children under the age of 5. We have heard stories about children's fears of latrine usage. We have also often encounter mothers' attitudes about the insignificant health risk of young children's excreta. In order to overcome these fears and attitudes, the barriers to change must be identified and addressed. What are the barriers to safe disposal of excreta from children under the age of 5? How have you seen or heard that mothers, families, and communities have overcome these barriers? What are the specific interventions required to overcome such barriers?

We look forward to sharing your ideas and experiences over the next few days.

Chris McGahey, Ph.D.

John D. McLennan, McMaster University:

Sub-topic 2: Barriers

Hello Dr. McGahey,

We have been investigating barriers to the engagement in preventive health practices by mother of young children in a poor peri-urban area in Santo Domingo, Dominican Republic. Though we have not focussed specifically on the disposal of excreta, some of these generic barriers may apply to this specific area. We were particularly interested in barriers where there appeared to be sufficient knowledge. Some of the barriers were:

(i) the age of the child (children beyond one year of age were often thought not to require the same level of protection as infants, e.g. need for boiled or otherwise purified drinking water; this may apply to excreta disposal in that infants may be kept well away from excreta, but there may be less attention to somewhat older children);

(ii) children themselves (manifested by children's non-compliance for drinking safe water and keeping shoes on; children of relatively young age appeared to be thought responsible for preventive health practices and when they did not comply there was not necessarily any follow-up; I suppose this could be an issue with relatively young children expected to be responsible for proper disposal of excreta which may not happen);

(iii) "descuida", a Spanish term, which roughly translates carelessness or neglectfulness; a significant number of women described this as a significant factors in explaining the knowledge practice gap and women would label themselves with this term;

(iv) lack of an alternative adequate caregiver; this was a problem particularly for women that worked outside of the home; young children were often left with somewhat older sibs or neighbours and the children did not received the same level of care as they would with their mother (this maybe a particular problem with families new to a periurban community that do not have an extended family to assist with childcare);

(v) poverty (in this case I would suppose this would be related to not having an adequate latrine);

(vi) lack of time (especially for a mother with a few young children, given time demands of bathing, washing clothes, food preparation, etc; the proper disposal of excreta may be further down their priority list);

(vii) forgetfulness;

(viii) being too tired;

(ix) the extent of social support;

Hope these findings are a useful contribution to the interesting discussion so far. Here are some references re: these barriers.

McLennan J (1998) Knowledge and practices of preventing diarrhoea in malnourished children. *Journal of Diarrhoeal Disease Research* 16 (4): 235-240
McLennan J (2000) Prevention of diarrhoea in a poor district of Santo Domingo: practices, knowledge, and barriers. *Journal of Health, Population and Nutrition* 18 (1): 15-22.
McLennan J (2000) To purify or not: drinking water for children in a periurban barrio. *Social Science and Medicine* 51: 1211-1220

Eckhard Kleinau, EHP:

Sub-topic 2: Barriers

Dear Colleagues,

The message by John McLennan has provided some very useful insights to barriers. based on his observations and the findings of others, I wonder whether it may be useful to define a few categories of barriers, for example:

- lack of coverage (in many African countries very few households have a sanitation facility that meets criteria of safe disposal, inadequate donor support to promote latrine construction)
- economic barriers (costs too high for poor households, no subsidies)
- physical or structural barriers (unsafe construction, lack of an adequate superstructure, access is difficult for young children, etc.)
- behavioral issues due to lack of awareness and information (John cited many of them)
- cultural and societal constraints

There may be others. A practical implication could be that each category may have specific interventions to lower the barriers. If that's the case, can we identify the most obstructive barriers and those that are most likely amenable to change?

Kind regards

Eckhard Kleinau, Dr.P.H., M.D.

John McLennan, Mc Master University:

Sub-topic 2: Barriers

Dear Colleagues,

I agree with Eckhard Kleinau that a categorization approach to barriers may facilitate thinking about interventions. However, I would further divide the category "behaviour", particularly as you have linked this with "lack of awareness and information", which I wouldn't have done. I think it would be useful to divide that proposed category into at least 2 separate categories.

One would be something like "knowledge deficits": which would represent a situation where there is limited knowledge or understanding about the dangers of excreta and/or its proper disposal. The second category would then be something like "attitudes and motivation".

Though one influences the other to a certain degree, we found little relationship between knowledge about a practice and the actual practice in our diarrhea prevention studies. A second reasons that I would separate them would be the implications for intervention.

Knowledge deficits would imply the need to provide information and education. This is probably one of the easiest and cheapest interventions and a popular one for health promotion/health education. However,

such interventions are often not evaluated as to their effectiveness in shifting behaviour and it is definitely not a given that increased knowledge will shift behaviour.

In the case of attitudes and motivation, interventions may be guided by some of the social/health behaviour models. One of the more popular ones right now is the "Theory of Planned Behaviour" by Ajzen, which includes (i) attitudes towards a behaviour, (ii) subjective norms, and (iii) perceived behavioural control. There is empirical support for this theory for explaining a variety of behaviours but I am not aware as to whether it has been used to inform excreta disposal.

I look forwards to others' comments on the other categories of barriers like cost and construction barriers which I know nothing about.

Thanks

John McLennan

Summary of Sub-Topic 2: Barriers to Safe Excreta Disposal

Dear Network Subscribers,

I was drawn in to the comments of Dr. McLennan, which were submitted on the last topic of barriers to safe excreta disposal for children under age of five. This occurred when he referred to "barriers where there appeared to be sufficient knowledge." Improving knowledge can, of course, serve to overcome barriers by itself, but it is in that more complex area he describes where so much of our efforts are centered. We frequently refer to the example of cigarette smoking where both knowledge of health risks and the barriers to change are very high. I once asked a team of medical doctors in Vietnam, who fully understood the risks, how many smoked cigarettes, and multiple hands were sheepishly raised. The dialogue between Drs. McLennan and Kleinau has served to illuminate a way forward into our further discussions. We will proceed with the following "givens" based on our past discussions.

1. Definition: Safe excreta disposal is any action which removes the pathogens contained in human excreta from further human contact at any time in the future.

2. Barriers to safe excreta disposal: They include, in general,

- Inadequate access to sanitation facilities
- Financial constraints
- Construction unfriendly to children
- Knowledge deficits
- Unsafe social/hygiene behaviors
- Cultural and societal constraints

Final thoughts on these two "givens" are welcome as we move into the next sub-topic.

Thank you all again for staying with us through the first two of five sub-topics. We at USAID's Environmental Health Project (www.ehproject.org) have been pleased with the Network dialogue as well as the side emails we have received from colleagues who let us know that they are following the Exchange. Please stay along as we devote the next seven days to hearing from you about how your work, or the work

of others that you have seen has addressed the identified categories of barriers to improve excreta disposal in children under the age of 5 in developing countries.

Chris McGahey

Introduction to Sub-Topic 3: Programmatic Approaches to Safe Excreta Disposal

Dear Network Subscribers:

A summary of the discussion on the last sub-topic, Barriers to Safe Excreta Disposal has been sent out.

We will now move on to the next sub-topic: Programmatic Approaches for Safe Excreta Disposal for Children Under 5. If however, you missed our deadline and have an issue you would like to discuss related to "barriers," please feel free to write to us.

- What do we need to do as part of our child health programs to "remove pathogens in human excreta from further human contact at any time"?
- What has been done so far?

If you have any field experience related to the above and/or have information to share, please write to us. The time frame for this discussion will be seven days (till close of business Thursday August 23).

The Moderator

EHP Information Center

Welcome to the third part of our Information Exchange Network on safe excreta disposal for children under the age of 5 in developing countries. Through the end of Wednesday, August 22nd, we will discuss programmatic approaches to safe excreta disposal, in particular, approaches focusing on ways in which the following barriers to safe excreta disposal have been addressed in your work or in work others have done that you know about:

- Inadequate access to sanitation facilities
- Financial constraints
- Construction unfriendly to children
- Knowledge deficits
- Unsafe social/hygiene behaviors
- Cultural and social constraints.

I will begin by relating my approach to overcome construction unfriendly to children.

While managing a sanitation program in a refugee camp at the Thai-Cambodian border, our team had notable success with the construction of "child size" latrines. All of the parts of the latrine floor and building were present - doors, roof, walls, squat hole - but each was made smaller to just fit a young child. These small versions of full-service latrines were installed at all health centers where safe use and hygiene behaviors could be promoted with the children and their mothers. This simple solution required no new

skills, funds, or techniques, only an appreciation of what barriers existed to increased hygienic use of latrines by small children.

I look forward to hearing about your success stories over the next seven days before we look at what gaps in our knowledge or programming still exist. I will join you next week from Kinshasa in the Democratic Republic of Congo.

Chris McGahey

Marla Smith-Nelson, WaterPartners International:

Sub-topic 3: Programmatic Approaches

Our staff recently evaluated a water and sanitation project in an urban slum near Tiruchirapalli, India. There we saw a "child-friendly toilet" or CFT. The CFT was a series of concrete squat toilets (with smaller, child-size holes). The toilets were open (there were no walls separating them), making it more fun for the children, who can talk to their friends while using the toilet instead of being in a small, dark enclosure. The CFT's had a long wall on one side, which was colorfully painted with animals. The CFT was the innovation of a local woman. In our observation, the CFT were well-used and maintained by the community.

Marla Smith-Nelson

Dan Campbell, EHP:

Sub-topic 3: Programmatic Approaches

Below is an abstract of a study on the use of potties for children under 3 or 4 of age. In this study "the use of latrines and flush toilets was not considered appropriate for children until they are three to four years old." Based on these initial findings, a micro-trial was conducted to assess the feasibility and acceptability of promoting greater use of potties and associated practices.

Defecation practices of young children in a Peruvian shanty town. IN: Soc Sci Med 1999 Aug;49(4):531-41
Yeager BA, Huttly SR, Bartolini R, Rojas M, Lanata CF. Instituto de Investigacion Nutricional, Lima, Peru.

Little is known about feces disposal practices, their determinants and feasibility for change, despite their importance in the control of diarrheal diseases. We report here the results of formative research for the development of an intervention to promote sanitary disposal of feces of young children. The study was conducted in a densely populated shanty town area of Lima, where water and sanitation systems are scarce. In-depth interviews were undertaken with mothers, husbands and community leaders. Group discussions were held with mothers in order to validate findings from the interviews, investigate particular topics further and explore reactions to possible intervention strategies.

The principal defecation sites for young children were diapers, potties, the ground in or near the home, the hill, latrines and flush toilets. The main determinants found were the age of the child, the effort required by the method, perceptions of dirtiness and the availability of resources. Almost all children under one year of age use diapers but the high resource cost of diaper washing is a strong motivation for mothers to move their children on as early as possible. Potties were considered the most socially acceptable and 'hygienic' defecation method for children between one and three years of age. Nevertheless, defecation directly onto the ground is common at this age. Potty training is deemed to be quite difficult and the long term

achievements are determined by the initial training success. In most cases, the training process is authoritative and inconsistent.

The use of latrines and flush toilets is not considered appropriate for children until they are three to four years old. Based on these initial findings, a micro-trial was conducted to assess the feasibility and acceptability of promoting greater use of potties and associated practices. The results of the trial were very encouraging and provided valuable information for the design of a community-wide intervention. Our findings help explain why the emphasis given in most sanitation projects, where efforts have been concentrated on the promotion of latrines, has failed to induce their utilization by small children. Sanitation projects should incorporate interventions that will promote hygienic defecation and stool clearance practices for infants and small children.

Vicky Blagbrough, WaterAid:

Sub-topic 3: Programmatic Approaches

Apologies for coming late to this discussion on safe excreta disposal for Under 5s. The Child Friendly Toilets mentioned by Marla Smith-Nilson are being promoted in Trichy, India as part of a project implemented by the local NGO Gramalaya and supported by WaterAid.

May Post, EHP:

Sub-topic 3: Programmatic Approaches

We have been discussing Child Friendly Toilets (CFTs). Marla Smith-Nelson mentioned that CFTs promoted in Trichy, India "were well-used" and "maintained by the community."

It appears that the community should play an important role in planning programmatic approaches in safe excreta disposal of children under 5. This is not surprising. In two studies that I was involved in Nepal, the community and the decision makers in the family (the husbands and the mothers-in-law) played crucial roles in health care seeking behavior of pregnant women.

It is important that IEC messages and Behavior Change Communication on the importance of safe excreta disposal and its implications involve/target not only the mothers, but also the community and the family decision makers. The community and the family decision makers can not only be the audience for IEC/BCC but can be trained to be the messengers/advocates of safe excreta disposal as well.

May Post, M.D.

Eckhard Kleinau, EHP:

Sub-topic 3: Programmatic Approaches

Dear Colleagues,

We read some very interesting success stories from India about approaches to lower barriers for children to use toilet facilities. A different approach using "bacinillas" (potties) was reported from Peru in the article by

Hutley and others. This approach is also promoted in other Central American countries, for example, in Nicaragua by NGOs and John's Hopkins University.

EHP addresses other barriers in Benin, where we are working with neighborhood committees to improve access to latrines, maintenance and the necessary financing. A partnership between local government, the public sector and communities helps to address a major public health problem and reduce diarrheal disease in children. Funds to build latrines are raised through micro-projects, including charging low user fees for community latrines. These revenues are used to build latrines and maintain a user-friendly and sanitary condition.

However, despite these and many other success stories, one big issue remains:

"How can we bring solutions that work well on a small scale locally to a much larger scale?"

In Africa especially, success at a local level has been shown many times, for example, with VIP-latrines in Ghana, Zimbabwe (which are among the few countries with relatively good access of over 50% in rural areas) and other countries. But to this date sanitation coverage in Sub-Saharan Africa overall is still very low, and virtually no progress was made over the past decade. According to the WHO Global Assessment 2000 (see http://www.who.int/water_sanitation_health/Globassessment/GlobalTOC.htm), sanitation coverage is well below 50% in rural areas in many countries. In at least 10 countries fewer than one in five households in rural areas have no access to a sanitation facility.

Do we have success stories where interventions to lower the barriers to the sanitary disposal of children's feces have been brought to scale, and how was it done? It would be very useful to know about organizations and projects that have the specific goal of scaling up and what approaches or key success factors they use. May Post mentioned the important role communities play, but there must be several others. In addition, even getting some operational definition of what we mean by "scale" may be helpful, is it a district, a town, a region, a country, and so on?

I am looking forward to hearing about your experiences and ideas.

Sincerely

Eckhard Kleinau

Summary of Sub-topic 3: Programmatic Approaches

Dear Network Subscribers,

Greetings from Kinshasa, Democratic Republic of Congo where humanitarian efforts have begun to evolve into community development activities in urban centers and rural health zones as tensions subside, the ravages of the recent war become known, and the landscape becomes open to longer term assistance.

Two very interesting lines of discussion emerged in the last session. The first had to do with some wonderful field experience concerning Child Friendly Toilets. I had to admire that an acronym, CFTs, has already been coined for these useful innovations, and who knew the success which could be achieved making safe excreta disposal not only a health priority but also fun? Thank you to WaterPartners for bringing this to our attention. The adoption of the idea by others in India is a credit to the creativity of the originator, the willingness of WaterAid to promote a success, and to the increasing ability of simple

Networks such as this to serve as a forum for discussion of a topic on which as Yeager and others correctly say "little is known."

We have, in this brief discussion, started to identify programmatic successes with application for school age and young children. The consideration of their needs and desires is clearly beneficial in the design of programs. Dr. Post expanded this "given" programmatic necessity to include engagement of family decision-makers - and their proper identification - as key determinants of health-related behaviors of their children. Yeager and others, however, focused on the even younger children: the small children who are not yet of age to engage a friendly CFT. What can we do for these children? What questions do we need to answer to better plan activities which support the safe disposal of their feces? It is these topics we look forward to addressing with you under the next sub-topic in this Information Exchange Network.

Our "givens" move with us:

1. Safe excreta disposal is any action which removes the pathogens contained in human excreta from further human contact at any time in the future.

2. Barriers to safe excreta disposal for children under the age of 5 which need to be addressed in programs include:

- Inadequate access to sanitation facilities
- Financial constraints
- Construction unfriendly to children
- Knowledge deficits
- Unsafe social/hygiene behaviors
- Cultural and societal constraints.

3. Programs can be implemented which address these barriers through:

- Expanded access to CFTs
- Reducing costs of facilities by reducing their size and superstructure to accommodate children and fun
- Addressing the knowledge level of care-givers
- Promoting safe behaviors in a playful way for children
- Identifying constraints and solutions with input from genuine decision-makers in households and communities.

Thank you all again for staying with us, and please do not apologize for arriving late, you really are too polite. We are glad just to have you visiting and helping USAID and the Environmental Health Project develop a framework for action. Please stay with us as we move to the next sub-topic where I hope that we will focus on the very young children investigated by Yeager, Huttly, Bartolini, Rojas, and Lanata - and the research questions which need to be answered to better understand about the "determinants and feasibility for change."

Chris McGahey

Introduction to Sub-topic 4: Operations Research

Dear Colleagues:

Welcome to the fourth part of our Information Exchange Network on safe excreta disposal for children under the age of 5 in developing countries. To date, we have been discussing definitions, barriers, and field solutions to address this difficult topic.

In this part, I hope that we will focus on those children under 3. And specifically, we will focus on the questions which we feel need addressing and can be addressed through operations research in field settings.

The time frame for this discussion will be three business days (till COB Tuesday August 28, US East Coast time).

As was presented in the last discussion, "determinants and feasibility for change" of potty use, diaper management, and defecation in the open (al fresco defecation, as a wise mentor of mine once called it) have arisen as the key topics to address. I would add one more which has puzzled me since encountering it in Vietnam. There, it is not unusual for a family to encourage defecation by very young children into a bowl. The feces are then typically fed to the family dog which is kept for security and, apparently, as a waste disposal technology. I have not yet heard a convincing response which makes me believe that this is not one method of safe excreta disposal - assuming the dog is a thorough eater. Your thoughts would be most welcome.

Remember the barriers to safe excreta disposal for children under the age of 5 which we identified:

- Inadequate access to sanitation facilities
- Financial constraints
- Construction unfriendly to children
- Knowledge deficits
- Unsafe social/hygiene behaviors
- Cultural and societal constraints.

Do these same barriers exist for children under 3? For those that do exist for this age group, what are your ideas of questions which need to be and can be addressed through operations research? We encourage you to provide some context to your contribution and propose in your response a question for consideration.

I continue to look forward to your input. I have enjoyed the conversation so far, learning about the centers of interest which exist, and progressively assembling what is beginning to look like a framework for action to expand safe excreta disposal for children under the age of 5.

Chris McGahey

John McLennan, McMaster University:

Sub-topic 4: Operations Research

RE: Excreta disposal issues in the under 3 group

My previous comments on generic barriers to health practices by parents for children was for young children and most on my studies have focused on children under the age of 3. For you who did not see my comments before, this is with re: to studies in a poor periurban of Santo Domingo, Dominican Republic on prevention practices by parents in general, i.e. not specific to excreta disposal.

From this work, I would suggest that there is a need to further breakdown the 3 and under age group, perhaps to infants (0-1years) and toddlers (2-3 years). Our findings suggested that there is a significant decrease in the amount of care for children around one year of age (e.g. in providing purified drinking water to a child). I think this may partly be related to the children's mobility. Children typically beginning walking around 12 months of age. This greater mobility allows children to get out of view of the parents more quickly. Given that they may be running around naked at this time, they are free to defecate wherever without their parents' awareness. However, prior to this age, there seems to be a much higher degree of care and on informal observation children are more likely to have diapers (occasionally just underwear) and are thoroughly cleaned if they defecate. I don't recall seeing children over 1 year of age in diapers, usually just underwear (for the girls anyway) and the boys underwear or naked at this age (although some will have a full set of clothes).

I would think these observations would have ramifications for excreta disposal. For example (1) management of diaper cleaning for infants; (2) monitoring of toddlers to scoop up their poop. I would like to throw out an unrelated question/issue that was inspired by the dog story provided by Chris. Does your group or others address the problem of animal feces? In the community where I have worked, there are a lot of dogs and some cats. A number of the cats wonder in and around the house (they are kept to keep the rats and mice from getting into household food). Dogs are generally kept in the yard for protection. I have heard nothing about animal feces from community health workers there except the concern over pregnant women being exposed to cat feces which I think is related to toxoplasmosis exposure.

Dr. John D. McLennan

Ines Restrepo-Tarquino, Colombia:

Subject: Comments on previous discussions

I have read all the messages in the web and I consider they are very interesting and useful. I have a comment on the subject although I do not know if it is pertinent. I agree with the definition and I would like to add as a barrier the way in which development projects are being executed in our countries by our own institutions and agencies. It seems that the discussion is mainly for external agents acting in specific projects

in developing countries. However, external agents usually can execute a very little portion of the WSS projects in a country and they go out at any time. The findings -like the ones of this discussion- are rarely incorporated in the wide WSS projects developed in a country. Now, when the WSS sector is in other hands different from the Health Sector ones, very often the health factors are not taking into account at all in the WSS projects. I have participated in several evaluations of WSS projects and I knew no one that had included neither children nor the olders in the analysis of the problems or in pre-designing the solutions.

Another barrier is that the community problems are fragmented by external institutions. For example, it is very common that the schools and community nurseries in a settlement be no a part of the WSS projects nor any communal place. So, any wide approach should consider how the health aspects be introduced in the institutional project cycle followed by the country agents in charge of supporting WSS projects. Otherwise, the interventions by foreign organisations do not have any impact in a country. They are so good to be published in books and journals but we, as a country, do not have benefits from them.

Sorry about my English, it is Spanglish but I hope that you have understood what I had said. When foreing organisations act, language is another great barrier in the WSS sector (and of couse, in the projects)!

Best wishes,

Ines

Val Curtis/London School of Hygiene and Tropical Medicine:

Sub-topic 4: Operations Research

Dear Colleagues

Ines raises an issue that has worried us for a long time and I wonder if any participants have any good ideas. She says that knowledge about Watsan/hygiene is concentrated in external agencies and in books and papers which national implementing agencies and field staff have little access to. How then can we get this knowledge, which is often concentrated in all the wrong places, better disseminated?

Any thoughts on this would be most welcome.

Val Curtis

May Post/EHP:

Sub-topic 4: Operations Research

When planning and implementing programs, sustainability is a crucial issue. Ms. Restrepo-Tarquino and Dr. Curtis highlighted the need in different ways through their comments.

Particularly in programs related to hygiene improvement, hygiene behavior and behavior change, sustainability of behavior change and created household demand need to be ensured.

During the project implementation phase, the focus of projects is on creating demand through provision of new knowledge and changing of behavior and practices. However, the next step--sustainability of behavior change and household demand brought about by program interventions -- is not given much thought, in general.

Below are some generic suggestions for the sustainability of hygiene behavior change and household demand, when the project is over and "external agents go out."

- Advocacy to ensure that senior national MOH staff understand the importance of continuing health and hygiene education and demand creation activities (end result--political commitment and resource allocation)
- Institutional capacity building-- developing and training health and hygiene education units within national MOHs
- Encouraging intersectoral collaboration for resource mobilization (e.g., the education sector can provide health education materials or include hygiene promotion in their school curriculum)
- Encouraging program staff to contract with private sector groups as appropriate (using private sector supply systems for supply of soap for handwashing, manufacture of hardware, construction and maintenance of latrines and water systems, etc.) to ensure availability of recommended services. Once the demand has been created, the services have to be there.
- Developing capacity (through training) from the central level to the grassroots community level for: formative research, use of mass media, training in health education techniques, community organization and development, and material development (end result--knowledge and information shared with nationals)

May Post, M.D.

Dan Campbell, EHP:

Sub-topic 4: Operations Research

I did a literature search on PubMed over the past 10 years and found epidemiological studies but found very few studies that focused on specific excreta disposal methods for infants/toddlers 3 years of age or under. 2 key authors on this topic are participants in our discussion: Val Curtis and John McLennan.

Please let me know if there are other sources I should check, such as WaterAid, etc. or if you know of other authors on this topic. I would assume that studies/projects have been done on this by ICDDR and others but for a librarian, it is nearly impossible to find these if they have not been published or indexed.

Below is a partial bibliography of the studies by Curtis and McLennan.

Bull World Health Organ 2001;79(6):518-527

Evidence of behaviour change following a hygiene promotion programme in Burkina Faso.
Curtis V, Kanki B, Cousens S, Diallo I, Kpozehouen A, Sangare M, Nikiema M.
Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, Keppel Street,
London WC1E 7HT, England. <mailto:val.curtis@lshtm.ac.uk>

OBJECTIVES: To determine whether a large, 3-year hygiene promotion programme in Bobo-Dioulasso, Burkina Faso, was effective in changing behaviours associated with the spread of diarrhoeal diseases. The programme was tailored to local customs, targeted specific types of behaviour, built on existing motivation for hygiene, and used locally appropriate channels of communication. **METHODS:** Two population surveys recorded the coverage of the programme among target audiences (mothers of children aged 0-35 months). Four surveys were carried out: three prior to the programme and one in 1998 (after the programme had been running for 3 years), using structured observation of hygiene behaviours in the participants' homes to document changes in target behaviours. **FINDINGS:** After the programme had run for 3 years, three-quarters of the mothers targeted had had contact with programme activities. Half could cite the two main messages of the programme correctly. Although the safe disposal of children's stools changed little between 1995 and 1998 (80% pre-intervention, 84% post-intervention), hand-washing with soap after cleaning a child's bottom rose from 13% to 31%. The proportion of mothers who washed their hands with soap after using the latrine increased from 1% to 17%. **CONCLUSION:** Hygiene promotion programmes can change behaviour and are more likely to be effective if they are built on local research and use locally appropriate channels of communication repeatedly and for an extended time.

J Health Popul Nutr 2000 Jun;18(1):15-22
Prevention of diarrhoea in a poor District of Santo Domingo, Dominican Republic: practices, knowledge, and barriers.
McLennan JD.
Canadian Centre for Studies of Children at Risk, Department of Psychiatry, McMaster University, Hamilton, ON,
Canada.

The study, conducted in a poor periurban community of Santo Domingo, Dominican Republic, assessed the practices, knowledge, and barriers relating to prevention of diarrhoea. A total of 582 caregivers of children, aged less than 5 years, were systematically sampled from four barrios. Results of the study showed that 55% of the caregivers did not boil drinking water for children; 38% did not always wash hands of the children prior to meals; 87% of the children did not always wear shoes outside their house; and 54% were breastfed for less than one year. Biomedical knowledge about these practices was high among the caregivers, and was not related to the reported behaviours. However, several barriers were significantly related to practices, including lapse in caregiving, limited resources, erroneous beliefs, and non-compliance by children. Health education, based on a biomedical knowledge-deficit model, may have little impact on improving the diarrhoea-prevention practices in these communities. Greater attention should, therefore, be directed toward the barriers experienced by caregivers of children.

Trop Med Int Health 2000 Jan;5(1):22-32
Domestic hygiene and diarrhoea - pinpointing the problem.
Curtis V, Cairncross S, Yonli R.
London School of Hygiene and Tropical Medicine, London, UK.

Improving domestic hygiene practices is potentially one of the most effective means of reducing the global burden of diarrhoeal diseases in children. However, encouraging behaviour change is a complex and uncertain business. If hygiene promotion is to succeed, it needs to identify and target only those few hygiene practices which are the major source of risk in any setting. Using biological reasoning, we hypothesize that any behaviours which prevent stools from getting into the domestic arena, the child's main habitat, are likely to have a greater impact on health than those practices which prevent pathogens in the environment from being ingested. Hence safe stool disposal, a primary barrier to transmission, may be more important than hand-washing before eating, which constitutes a secondary barrier, for example. We review

the epidemiological evidence for the effect of primary and secondary barrier behaviours and suggest that it supports this conclusion. In the absence of local evidence to the contrary, hygiene promotion programmes should give priority to the safe disposal of faecal material and the adequate washing of hands after contact with adult and child stools.

J Diarrhoeal Dis Res 1998 Dec;16(4):235-240

Knowledge and practices of preventing diarrhoea in malnourished children.

McLennan JD.

Instructions for preventing diarrhoea, based on a knowledge-deficit model, are a common health-promotion approach aimed at the providers of child care attending nutritional rehabilitation centres. However, there is rarely an assessment of baseline knowledge to justify the need for this type of intervention and to guide its form. This study investigated the practice and knowledge of recommended diarrhoea-prevention behaviours of caregivers of 78 malnourished children consecutively admitted to a realimentation programme. Major deficits included: 39% not boiling (or not planning on boiling) drinking water after the child reached two years of age; 35% not always washing children's hands before meals; only 17% reporting that it was rare for their children to go barefoot; and the majority breastfeeding for less than one year. However, almost all measures of knowledge, based on open and closed questions, were not related to the corresponding practice. Several types of barriers to preventive practices were reported on open questions, including, "beliefs," "children as barriers," and "time." This information may be helpful in designing more effective health-promotion programmes.

Soc Sci Med 1995 Aug;41(3):383-393

Potties, pits and pipes: explaining hygiene behaviour in Burkina Faso.

Curtis V, Kanki B, Mertens T, Traore E, Diallo I, Tall F, Cousens S.

Maternal and Child Epidemiology Unit, London School of Hygiene and Tropical Medicine/Centre Muraz, Bobo-Dioulasso, Burkina Faso.

Stool disposal practices have been shown to be associated with childhood diarrhoea. However, efforts to promote improved hygiene behaviour are hampered by a lack of understanding of what determines those behaviours. Data from 2793 household interviews with mothers of children from the town of Bobo-Dioulasso in Burkina Faso were analyzed to examine what differentiated mothers who reported using safer stool disposal practices from those who did not. Three 'outcomes' were considered: where the child was reported to defaecate; where the mother reported disposing of the child stools; and whether excreta were observed in the compound. Regression models were developed to identify those factors with the strongest independent associations with the outcomes. There was a consistent association between the source of water and the outcomes. Mothers with access to a tap in the yard reported using safe hygiene practices three times more often than mothers using wells outside the compound and twice as often as mothers who used public standpipes or wells within the yard. The source of water showed a similar pattern of association with observations of faecal matter in the environment. Improved sources of water may contribute to safer stool hygiene by reducing the time spent on water collection or by encouraging mothers to conform to higher standards of hygiene. Other factors which played a role in predicting the hygiene behaviour of mothers were the husbands' occupation, the number of health education sessions that she had attended, her zone of residence and family ownership of certain valuable objects. These factors are likely to be related and to be, to some extent, proxies for the real determinants of her behaviour. A model of the cultural, psycho-social and infrastructural proximate determinants of hygiene behaviour is proposed. Data from focus group discussions suggested that the main purpose of hygienic behaviour is to conform to existing norms of social etiquette. Trials of interventions based on changing such norms are needed to test whether this is an effective means of promoting of safer hygiene practices.

J Epidemiol Community Health 1994 Jun;48(3):270-275

Child defecation behaviour, stool disposal practices, and childhood diarrhoea in Burkina Faso: results from a case-control study.

Traore E, Cousens S, Curtis V, Mertens T, Tall F, Traore A, Kanki B, Diallo I, Rochereau A, Chiron JP, et al. *Ministere de la Sante, de l'Action Sociale et de la Famille, Bobo-Dioulasso, Burkina Faso.*

OBJECTIVE--To investigate the association between where young children defecate, where stools are disposed of, and the presence of human stools on the ground in the compound and the rate of hospital admission with diarrhoea. **DESIGN**--This was a case-control study with two control groups. **SETTING**--The study took place in Bobo-Dioulasso, the second city of Burkina Faso in West Africa. **PARTICIPANTS**--Three groups of children aged 36 months and under, and living in Bobo-Dioulasso were studied. Cases were 757 children admitted to hospital with symptoms of diarrhoea or dysentery. The first control group comprised 757 neighbourhood control children approximately matched on age and date of recruitment, and the second, 631 children admitted to the same hospital without symptoms of diarrhoea or dysentery. **MAIN RESULTS**--There was no evidence of any association between where the child was reported to defecate and hospital admission with diarrhoea or dysentery (odds ratio = 1.10; 95% confidence interval (CI) 0.78, 1.57, cases v neighbourhood controls; odds ratio = 0.84; 95% CI 0.60, 1.18, cases v hospital controls). There was evidence of an association between where the mother reported disposing of the child's stools and hospital admission with diarrhoea or dysentery (odds ratio = 1.50; 95% CI 1.09, 2.06, cases v neighbourhood controls; odds ratio = 1.31; 95% CI 0.96, 1.79, cases v hospital controls). Human stools were more frequently observed in the yards of cases than controls (odds ratio = 1.38; 95% CI 0.98, 1.95, cases compared with neighbourhood controls; odds ratio = 1.33; 95% CI 0.96, 1.84, cases compared with hospital controls). **CONCLUSIONS**--The findings suggest that it is not where the child defecates that matters but how the mother then deals with the child's stools.

Chris MaGahey, EHP:

Sub-topic 4: Operations Research

Dear Network Subscribers,

We covered a great deal of ground during the fourth part of our Information Exchange Network on safe excreta disposal for children under the age of 5 in developing countries. A variety of important issues were raised, and a significant negative finding was made. In subtopic 4, we set out to focus on children under 3 and the questions which we feel need addressing and can be addressed through operations research in field settings. The correct decision was made to extend the duration of the topic as the discussion raised multiple larger issues while spreading information regarding the good works of Drs McLennan and Curtis.

With regard to operations research questions, we found that a small set of information is known - thanks go to EHP Librarian Dan Campbell for that bit of quick investigation. But, we also found that we know very, very little factual evidence concerning safe excreta disposal for children under the age of 3. In subtopic 3, we saw that Yeager et al had earlier demonstrated how little we know. The current discussion has reinforced this for us. Dr. McLennan also pointed out the significant issue of focusing research on two separate groups of children: those under the age of one and those between one and three years of age.

This simple and direct point will be remembered by EHP as we move into the design of field research activities.

Then our colleague Ines Restrepo-Tarqino took us in another unanticipated and wonderful direction concerning programmatic barriers to success. Dr. Curtis emphasized the importance of this issue, but I have yet too see any responses to her invitation for input and ideas - come now, we can't all just be satisfied with

raising the problems. I will look for you to creatively respond with ideas to Dr. Curtis - this issue has been around for many years with little progress being made! Ines' specific point on how we carry our centralized discussions into practice is, of course, key and of great concern to me as I work in both worlds - for example, as I write these words and take in the comments from each of you around the world, I am designing urban environmental health activities which integrate improved access to hardware, hygiene promotion, and support for enabling organizational environments to reduce diarrheal disease in children under five. I am in the fortunate position of having your input for incorporation into the design with local NGOs and government officials. Finally, the idea Ines presents of involving children in the design process is innovative and clever, and we should look for opportunities to do just that. Why should our focus groups always be limited to adult participants?

To address Ines' additional point about institutional barriers to cross-sectoral implementation and sustainability, I commend Dr. Post for her input. I also recommend each of you to obtain, review, and apply the Approach to Better Sanitation Programming. This document was produced jointly by the Environmental Health Project (EHP) and UNICEF. It is available for downloading from the EHP website at <http://www.ehproject.org/>. This document presents a detailed program for cross-sectoral planning for national water supply, sanitation, and hygiene interventions.

But returning to our original objective, you all have been quite shy in proposing questions to address. I will allow you this luxury during this sub-topic, but I will really need you to look forward as we enter sub-topic 5: Gaps and Next Steps. I am counting on you.

Chris McGahey, EHP

Introduction to Sub-topic 5: Gaps and Next Steps

Welcome to the fifth part of our Information Exchange Network on safe excreta disposal for children under the age of 5 in developing countries. To date, we have rooting about to uncover the level of knowledge which exists on this complex topic. I want to sincerely thank each one of you for contributing, and I want to welcome each of those who have joined us along the way. You will have an opportunity to give us some of your impressions of the utility of this type of network in the near future, but for sub-topic 5, I need all of your good minds to look forward and creatively develop some ideas concerning Gaps and Next Steps. In this part, I hope that you will contribute your ideas on what you believe are the most important gaps in our understanding and what steps are needed to fill those gaps.

The time frame for this discussion will close on Thursday, September 6 at 5:00 p.m. US East Coast time.

Let us take operations research as an example. We now are quite confident that not much operations research, if any, has been done on safe excreta disposal for children under the age of 5. That is an obvious information gap which we need more information to fill. So, what is the next step? Operations research on the topic. Therefore, I need your input on ideas or questions which can be addressed and on how you think they could be addressed.

And, what are your ideas of concrete next steps which can help us move forward. For example, should we:

- identify a project to work with?
- establish an independent pilot project?
- organize a technical working group meeting to give substance to possible questions?

These are only the easy options which may help us move forward. I am looking solidly to you - and particularly those of you who have been silent (we have the master list!) - for brainstorming ideas to move us toward conclusion of this Information Exchange Network. Thanks in advance, and I will join you next from back in Washington, DC.

Chris McGahey, EHP

Conclusion to the Information Exchange Network

Dear Information Exchange Network Colleagues:

With regret, we must bring this Exchange Network to a close. We were surprised at your silence related to the final sub-topic, "gaps and next steps." But the absence of input is indicative of the field we have been addressing-not much is known on the topic and next steps/the way forward is not crystal clear. But it is this area where the Environmental Health Project (EHP) will be focusing beginning in late October - so we will certainly be back in touch with you for ideas, and to notify you of progress related to Safe Excreta Disposal for Children Under the Age of 5 in Developing Countries.

To maximize the usefulness of this information exchange effort (since this approach is new to us), we would like to hear from you if this has been beneficial, frustrating, disappointing, or otherwise.

- What was most useful to you during this Exchange?
- What was least useful to you during this Exchange?
- What would you like to have seen more of during the Exchange?
- Would you participate in another Exchange of this type on a different topic?
- What other comments do you have to improve the Exchange?

We hope to use this mechanism of communication again. The discussion, contacts made, and resources identified have been remarkably useful to us- and we hope to you also.

Thanks to each of you for your time, your participation and your valuable input. The summaries and comments can be found on the EHP website at

We look forward to our next opportunity to exchange information on another aspect of improving health of children by preventing diarrhea in developing countries.

Chris McGahey, May Post and Dan Campbell

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