Bringing the Consumer to the Table:

A Research Tool for
Assessing Consumer Perceptions & Practice of Household Water Treatment Methods

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The full survey, brief report, study tools, list of variables and SPSS analysis program are available through the HIP website at **http//www.hip.watsan.net**

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HYGIENE IMPROVEMENT PROJECT

Understanding the consumer or household viewpoint is critical to the uptake of household water treatment and storage methods. To reduce diarrheal disease due to water contamination and achieve household and public health impact, water treatment methods must not only be efficacious in inactivating pathogens that cause diarrhea. They must be feasible and affordable to householders, and practiced consistently and correctly.

Incorporating consumer perception and practice into household water treatment strategies is vital to creating effective and sustainable programs. HIP, together with the Network, has developed this tool for program planners to adapt and use in planning household water treatment strategies and programs.

This formative research tool combines several qualitative and quantitative techniques to explore both consumer perception and practice regarding water storage and treatment. **The tool's overall objective is to guide strategy development for promoting household ("point-of-use" or PoU) water treatment methods. This may be part of an integrated hygiene improvement approach or a stand alone household water treatment promotion or marketing program.**

The tool guides planners to examine relevant consumer perceptions of various water treatment methods over time (as designed, over a one month trial period). The tool looks at consumer reaction to various treatment methods across a set of characteristics:

Taste
Smell
Temperature
Appearance/Texture
Effort
Perceived Effectiveness
Value/Perceived cost
Acceptability to family members

These characteristics capture the range of considerations most critical to consumers in a variety of settings, although additional characteristics may emerge in different contexts, and the list is open to modification. The tool explores consumer perception and practice of one water treatment method over time, but also invites comparison and elicits preference among all available methods.

The tool measures consumer success in effectively treating water in the home environment by measuring contamination at three points in time, before treating water, three days after using the method, and about 30 days after using the method.

Lastly, the tool uses a negotiation technique which invites participants to express difficulties and dislikes in using the methods, and works to identify feasible solutions that reduce barriers to using methods consistently and correctly. Participants in this Study to Explore Consumer Perception and Practice could be considered "consultants" as much as traditional "respondents", as they are actively engaged in problem-solving and developing effective practice that safely treats water in the most economical and convenient way.

The practice of water treatment is a complex behavior. Products and supplies must be available, householders must believe that drinking water may have negative health effects and they must be motivated and possess the skills to practice the treatment consistently and correctly.

Water treatment practice can be broken into the following sub-behaviors:

- Obtain water
- Separate drinking (& cooking) water
- Place/store in a clean vessel
- Choose a method/obtain that method
- Treat correctly
- Protect (cover, store and use without secondary contamination)
- Drink this water always at home (at work, and in school)

This final research technique draws on two methodologies, Trials of Improved Practice (TIPS) and a second-generation TIPS technique developed specifically to explore household water practices, Negotiation of Improved Practices (NEPRAM). The technique involves communities and health planners to collaboratively develop effective and feasible behavior change interventions using analytical techniques and continuous community feedback. Unlike traditional research that standardizes the "stimuli" or questions to respondents and then documents variations in response to a particular stimulus, this participatory research method invites dialogue between research and households to identify barriers and find (or *negotiate)* feasible solutions. All barriers and modifications are carefully noted and become part of the pool of information (your database) for analysis and application. For instance, if a participant reveals in the second visit that her particular water treatment method is difficult to clean, the researcher reviews current cleaning practice and 'negotiates' a modification that seems easier but still appears effective. Effectiveness is measured through water contamination tests.

[TIPS Ref: *Designing by Dialogue: A Program Planners' Guide, SARA Project*, Kate Dickin and Marcia Griffiths (Manoff Group) and Ellen Piwoz *(SARA Project/ HHRAA/AED), 1997.* NEPRAM Ref: *Planning social mobilization and communication for dengue fever prevention and control: a step-by-step guide*, Julia Rosenbaum and Elli Leontsini (AED/CHANGE), edited by Linda Lloyd and Will Parks, WHO, 2004.]

Households must be able to perform each behavior consistently and correctly to realize household and public health impact. Each sub-behavior carries its own set of barriers and challenges that must be low enough to assure the practice of the entire set of behaviors. This tool helps to explore the complex behavior of water treatment in order to develop effective behavior change strategies.

The tool includes:

- A brief quantitative survey of current practice and perception, to be administered at Day 1.
- Question guides including qualitative and closed-ended questions for two household visits at Day 3(ish) and Day 30 (ish)
- Water contamination test applications at Days 1, 3 and 30 (We used a field-friendly Presence/Absence Vial for fecal coliform)

The various tools were designed to be used together, but depending upon particular objectives and information needs, planners may decide to use only some of them.

To use this tool requires a mastery of or access to expertise to analyze both qualitative and quantitative data. The Nepal study report, Bringing the Consumer to the Table: Perceptions and practice of household water treatment methods in Nepal, is available through www.hip.watsan.net, and illustrates the type of analyses useful to project planning. The SPSS analysis template can also be downloaded from the site.

Formative research, conducted primarily at the start of a program, is designed to organize critical social, behavioral, and epidemiologic information relevant to planning an effective program strategy. The information helps to inform strategies being developed. Formative research on household water:

- Documents what local populations are doing, thinking, and saying about water and sanitation; current practice and access to the various technologies;
- Inventories contact with volunteer, government, and community personnel through their varied outreach activities;
- Identifies current perceptions of risk, and explores how householders link their current water source, collection, storage and treatment practices with diarrheal disease;
- Identifies specific behavioral objectives for the program strategy;
- Identifies existing practice that with slight modification could become more effective at removing or reducing health risks;
- Discovers key cultural norms and analogies that can be used for health education messages;
- Examines obstacles that might inhibit adopting new behaviors and ways for resolving them;
- Investigates motivations and opportunities for change and identifies where people are in the behavior change process;
- Provides information on how best to implement the strategy (who, when, where, how).

Adapted from *Planning social mobilization and communication for dengue fever prevention and control: a step-by-step guide*, edited by Linda Lloyd and Will Parks, WHO, 2004.

PURPOSE OF THE RESEARCH TOOL

This tool aims to guide program managers who are developing a strategy to promote household ("point-of-use" or PoU) treatment methods. The tool will help program managers understand the context in which they are trying to develop their strategy, and by doing so will maximize the likelihood of target communities adopting and maintaining new water treatment and storage practices.

RESEARCH OBJECTIVES

By using this formative research tool, program managers should be able to:

- Understand current water collection, storage, treatment practices;
- Document the perceived causes of contamination;
- Understand what qualities consumers associate with good, fit water, and what risk they associate with dirty or unfit drinking. e.g. Are diarrhea, ARI, other disease associated with unfit water?
- Understand the range of consumer reaction to four PoU treatment methods across a set of criteria (e.g. taste, smell, effort, temperature);
- Document perceived benefits of and barriers to water treatment in general and specifically to particular methods;
- Document key effectiveness issues for the various methods: can householders/ consumers practice the behavior correctly after a demonstration? Do they adhere to the proscribed procedure or modify? What modifications are made? Do these modifications/ lapses affect efficacy?
- Determine whether the various methods deliver to consumers the set of perceived qualities of good, quality drinking water;
- Document the perceived costs (both price and effort) of consistently practicing a particular treatment method, and reactions to actual cost;
- Understand the range of family and community members who are consulted on water treatment. Document what kinds of things participants talked about to whom;

- Explore consumers' willingness to pay for the various treatment methods AFTER experiencing the effort and benefits of using the method over time. *Participants can't report on actual costs or burden to acquire method because we're 'giving' it to them.*

Water Treatment Methods Under Exploration

This tool specifically includes four treatment methods, but could easily be modified to include other available methods of interest:

Solar disinfection (SODIS)
Chlorination (Sodium hypochlorite, non-branded)
Colloidal Silver Filter (but applicable to any filter)
Boiling- introducing the "new" method for boiling- just bring to a boil and stop

The Biosand filter is another method that could be integrated into this tool. But in the pilot application of this tool in Nepal, logistical issues (the weight of the filter and its difficulty to transport) posed problems in Nepal, so a separate but related household question guide module was developed for the Biosand filter.

Sample Sizes and Recruitment of Participants

Sample size and recruitment of participants is flexible and should be determined by the researcher's objectives and information needs. This tool is designed for a relatively small, purposive sample (non-random, based on a set criteria), to allow for intensive, qualitative data analysis. We assume that an additional representative baseline survey will also be conducted to systematically evaluate changes in key practices.

All participants should be mothers with children below 5 years of age**, the eventual target of most water treatment programs.**

It is not necessary to randomly recruit participants, although depending upon geography and conditions, researchers might decide to randomize the sample. When using a purposive sample as we are recommending participants should represent a range of 'typical' households in each district, to the greatest extent possible. Thus, study households should represent the different typical water sources available in the region; and participants represent different ages and education; different ethnicities if any.

A minimum of 15-20 total participants per method is recommended. Other considerations, such as variation within or among project district(s), may suggest an expanded sample to assure an accurate representation of the target population.

Choosing households is somewhat subjective. Select participants with reasonable access to researchers for logistical reasons. This may create some selection bias and skew the sample slightly upward (because logistic access often means closer to a main road, which may include more affluent or more educated participants.) We recommend matching the demographics of study participants against a 'standard' such as the Demographic and Health Survey to ensure the sample is representative.

The purpose is to recruit a sample of typical people. While it is fine to recruit a particularly articulate survey respondent, be certain NOT to recruit only super-highly motivated participants.

Involving local leaders or district personnel with an intimate knowledge of their regions/districts in purposive recruitment is recommended. These people can identify households likely to meet the criteria and may also be able to help during program implementation.

Recruitment should be monitored closely throughout the recruitment process to assure for meeting the criteria. We recommend using a matrix to monitor participant characteristics across the sample.

Interviewers

Interviewers must be skilled in quantitative and qualitative interview methods. All researchers must be literate, and be able to write extensively with ease, in order to capture extensive and subtle information from the household visits, particularly the negotiation of improved water treatment practice. Training must reinforce particular competencies needed, such as probing and negotiating behavior change. Training notes are available.

The number of interviewers needed depends upon the overall sample size, geographic spread, and travel time between participating households.

Home visits one (including the survey) and two require just over one hour in the home. The third visit takes between one and a half and two hours, to allow time for demonstrating the entire set of methods. In Nepal, we had eight interviewers, split into two teams plus a supervisor who also helped with interviews. Each team covered two districts, and administered all three research instruments (the survey, the household interview and negotiation; and the water quality test.)

STUDY PROCEDURES

Field Work Process

The study should be carried out in three phases, Home Visit 1, Home Visit 2 and Home Visit 3.

Home Visit 1:

During Home Visit 1 the data collector explains the study's purpose to the woman and invites her to participate. An abbreviated baseline survey is given to gather information, respondent demographics on current water hygiene practices, awareness and practice of methods to make water fit for drinking.

One method, previously selected, is demonstrated to the woman and she is asked to continue using this method for one month. The demonstration focuses only on procedure and not on the benefits and challenges of the water disinfection method.

Take a sample of water from the vessel that is the primary source of drinking water for the household. Pour the water from the source or primary storage vessel into the previously labeled test vile, and carefully put aside for transfer to the survey supervisor. (Most positive/negative viles take some time, often 24 hours, to react positively or negatively. Results are noted by household.)

Home Visit 2: After 3 days

During Home Visit 2 the data collector aims to get information on participants' reactions to use, their assessment of water by the key characteristics – taste, smell, temperature, effort, etc. Data collectors also ask the women to compare this water to the water they were drinking before the treatment method was introduced. Data collectors also:

- Test water quality
- Solve problems with using the particular disinfection method (if necessary)
- Request participants to continue using the method for another month.

If a woman declares that she is STOP using the method, and she clearly means it, the data collector can offer an alternative method. Problems encountered and any negotiated solutions should be documented as study findings on the home visit research instrument.

Home Visit 3: After 30 days

Home Visit 3 aims to get participants' reactions to the water treatment method after an extended period of use and to assess the water by the same set of characteristics: taste, smell, temperature, appearance, effort, perceived effectiveness, and perceived value. Data collectors again ask the women to compare this water to the water they were drinking before the treatment method was introduced. In addition, women discuss their perception of treating water over time, family reactions to treating, consuming and maintenance.

In this last visit, data collectors demonstrate all the other water treatment methods. After the demonstration, women discuss their immediate reactions to the other methods, also according to the same key characteristics of taste, smell, temperature, etc. They are then asked to compare the method they have been using for the month with the other methods.

In developing the study methodology for comparing methods, we struggled with the design. Comparing use of one method that was used for a month with other methods the women are just learning about is not an ideal comparison, but time and budget would not allow for women to try several methods for one month each. We decided some comparison was better than none, and just hearing women speak comparatively about the methods allowed us to learn generally about their preferences and priorities. For example, hearing a woman comment, "*Oh, this filter treats water so much faster than the SODIS I've been using*" gives an opening to the researcher to explore the importance of speed and volume of treatment methods.

Research Instruments

All tools are found in the annexes. Questions were developed for use in Nepal, and were pretested numerous times to:

- Appraise respondents' comprehension, attention and interest
- Assess questionnaire flow
- Include appropriate range of response categories for later coding both open and closed questions.

When applying in other settings, all instruments should be pretested again for comprehension and response categories. Resources on how to conduct pretests are available through web and print.

CHECKLIST and OBJECTIVES OF HOUSEHOLD VISITS ONE, TWO & THREE

Household Visit One

Summary of Objectives

- *Build rapport*
- *Administer brief survey*
- *Demonstrate assigned method*
- *Explain to mother that participation will help design a very important new program,*
- *Explain to mother that we're asking she uses this water cleaning system/method all the time for 30 days and tell us what she and her family think about the water system.*
- *Note immediate reactions/questions*
- *Note any immediate problems that need solving*
- *Take water sample from vessel that is the PRIMARY storage source for household drinking water.*
- *Ask brief qualitative questions and note responses*

Checklist of Materials and Preparation

- *Survey Instrument*
- *Household Interview Worksheet #1*
- *Water Treatment Methods (One preassigned method for each household visited)*
- *Water Testing Vile*
    - *SODIS - PET Bottles, Instruction sheet*
    - *Chlorination - Chlorination Bottle*
    - *Boiling - Kettle*
    - *CS Filter - CS Filter, toothbrush, instruction guide included in the CS filter box*
- *Cloth for sieving/straining*
- *Steps/guide for interviewers to explain method*
- *Problem solving guide*

Household Visit 2

Summary of Objectives

- *Document initial reactions to use*
- *Assess mother's perception of water by the key characteristics: taste, smell, temperature, appearance, effort, perception of effectiveness, value*
- *Assess preferred preference: is the water is better or worse than before they had the 'PoU device', and why*
- *Test water quality*
- *Identify problems and help find solutions, if needed. If the mother does not seem to be motivated to use the method, encourage her to try again*
- *Request her to continue using the method*
- *Set date for next visit*

Checklist of Materials and Preparation

- *Household Interview Worksheet #2*
- *Water Testing Vile*
- *Problem solving guide for interviewers*
- *Data collectors should review the baseline questionnaire responses before the visit to make sure they remember each respondent's answers*

Household Visit 3

Summary of Objectives

- *Document her reactions to using this method for longer time.*
- *Assess mother's perception of water by critical factors: attractiveness, acceptability, effort, perception of effectiveness, value, family reactions.*
- *Assess whether mothers feel the water is better or worse than before they had the 'PoU device', and why.*
- *Test water quality.*
- *Identify problems and solve, if needed.*
- *Demonstrate other PoU methods*
- *Document reactions to other methods. Have mother compare her method with the other methods, by key characteristics of temperature, taste, smell, appearance, etc.*
- *Thank mother for trying out the method. Reiterate that her participation has been very helpful to program planners and share any information about what she might expect to see in the future (promotion efforts, etc)*
- *Leave method with household as token of thanks*

Checklist of Materials and Preparation

- *Household Interview Worksheet #3*
- *Water testing vial*
- *Water Treatment Methods (One preassigned method for each household visited)*
    - *SODIS - PET Bottles, Instruction sheet*
    - *Chlorination - Chlorination Bottle*
    - *Boiling - Kettle*
    - *CS Filter - CS Filter, toothbrush, instruction guide included in the CS filter box*
- *Cloth for sieving/straining*
- *SODIS water sample*
- *Steps/guide for using methods*
- *Problem solving guide for interviewer*

Analyzing Survey Data

Using this tool, as mentioned earlier, requires a mastery of or access to expertise to analyze both qualitative and quantitative data.

Quantitative survey data should be analyzed for frequencies, or the percentage of responses given to each question. You can also run crosstabs to explore various relationships of interest, such as the relationship of current water sources or perceptions of water quality with current water treatment practice. In other words, are people more likely do be doing something to treat your water if you get it from a shared community well than a private one? Are people more likely to do something to treat their water if they think it is often unfit for drinking?

In Nepal, researchers used EpiData for data entry and SPSS for data analysis. EpiData is a program for Data Entry and documentation of data distributed as freeware. EpiData is

based upon the MS-DOS program EpiInfo v6 created by CDC. Visit www.cdc.gov/epiinfo.htm for more information. As mentioned above, the data entry program is a freeware and can be downloaded from http://www.epidata.dk/download.php .

For analysis of the data, we used SPSS. The data entered in EpiData can be exported to SPSS format. (Since this exported SPSS file does not have the labels in the SPSS file, this data can then be copied and pasted to the SPSS analysis sheet for further analysis.) Copies of these two files can be found on the HIP website.

Analyzing Information from the Household Visits

Information from household visits should be analyzed by method, and across methods. Note likes and dislikes of each method according to the various characteristics: Taste, smell, temperature, effort, appearance, texture, family reaction, etc. Researchers should look for differences and similarities across methods and regions, if applicable.

Identify the benefits of water treatment that people valued by method, and across methods. What qualities do they recognize as assuring water is fit or unfit for drinking?

Pay special attention to barriers. Note both problems and any solutions, which should be re-tested under controlled conditions for effectiveness. Did any existing practices reinforce water treatment and safe storage? What cultural analogies and norms provided motivations or barriers to using treatment methods?

Analyze householder effectiveness in treating water, by method, after the second visit. (Most vile tests take time to show contamination, usually up to 24 hours.) Contamination should be substantially lower after using treatment methods. For households with contaminated water after treatment, use the third household visit to explore possible reasons for contamination. Physically examine filters for leakage or breakage. Are filters leaking through the "punch" between top and bottom buckets? Did householders remove candles (not necessary) and introduce contamination to the lower bucket? Were householders correctly treating water (using enough chlorine, bringing water to a full boil, etc.) What are possible sources of secondary contamination? Work with the householder at the third visit to try to document possible sources of contamination.

Applying findings to a behavior change or marketing strategy

Remember the overall objective of this research is to develop an effective strategy to promote water treatment. The behavior change strategy is an overarching road map; it is how the program will develop effective approaches for adopting and maintaining the

practice of treating and safely storing drinking water. It focuses on identifying barriers which must be addressed, and incorporates facilitating factors, preferences, and so on. Your marketing or behavior change strategy is NOT the same as a communication or promotional strategy, which deals with messages and tactics.

Based on findings, decide whether one approach applies to your entire geographic region of intervention, of whether several strategies are needed. Should people choose one method for water treatment, or become familiar with several and use a particular method under certain conditions? For instance, is water source or water quality (such as arsenic) dictated by geography, so that only certain treatment methods are appropriate for that region. Are discarded plastic (PET) bottles unavailable in rural areas, so that SODIS can only be promoted in urban and peri-urban areas. Are seasonal strategies required, or can the same approach be used year round? Several factors will influence these decisions, but the formative research results should provide enough information to develop a strategy.

Remember: treating water consistently and correctly is complex. To "treat", the householder must:

- Obtain water
- Separate drinking (& cooking) water
- Place/store in a clean vessel
- Choose a method/obtain that method or supplies needed for treatment
- Treat
- Protect
- Drink water always at home (at work, and in school)

The data set from this tool will answer questions that arise as a behavior change strategy is developed. For example, with the information now available, how can the strategy minimize barriers to obtaining and separating water; choosing and obtaining a method; practicing regularly? The strategy may need to focus on increasing the availability of additional water storage containers so that consumers can separate drinking and cooking water from other water. It may need to increase access to plastic PET bottles so that consumers will use solar disinfection.

Do consumers understand the link between contaminated water and disease? Do they feel their water is currently fit for drinking? What benefits, particularly non-health benefits, do people see to disinfecting their water? All these data should be incorporated into the strategy.

Regarding the qualities that consumers recognize as assuring water is fit or unfit for drinking, do we need to modify perceptions of the characteristics of fit water? For

example, in Nepal, most householders felt that clear, cold water was "fit" for drinking and could not cause illness. This perception has to be addressed if people are to treat their well water, particularly with treatment methods that heat the water or allow it to get warm. Does your strategy need to focus on modifying treatment products to meet consumer expectation of water that is fit for drinking. For instance, do water filters with slow flow rates need bigger buckets to allow for a bigger reserve? Does chlorine need a higher concentration because people are storing in wide-mouth open containers?

The concept of "negotiating improved practices", used first as a research methodology, can be applied to the strategy, as well. Rather than promoting ideal behaviors leading to improved health outcomes, home visitors (be they Ministry of Health promoters, various community volunteers, sanitation inspectors, NGO promoters, etc.) can "negotiate" improved behaviors, often a dramatic shift in program practice. Instead of working as educators or distributors of water treatment products or practices, they become facilitators of change. Data and experience from the negotiating and problem-solving during the home visits can be applied to guidelines for negotiating solutions as the approach to home visits in the intervention. Likewise, enthusiastic study participants can be recruited as appropriate to promote water treatment as part of the outreach strategy.

For an example of how research data was applied to developing a household water treatment Marketing Strategy, you can find the complete Nepal Point-of-Use Marketing Plan on the HIP website, www.hip.watsan.net.

Good luck! Go out and explore! Hear the consumer voice! And please don't forget to tell us about it through our website www.hip.watsan.net.

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