

***CLEAN DRINKING
WATER AND SAFE
WASTE DISPOSAL***

*A training curriculum for lay health
educators*



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Activity	Methodology	Materials Needed	Time
Introduction <i>Complete pre-tests; review the workshop objectives; review local water & sanitation conditions</i>	Group Discussion	<ul style="list-style-type: none"> • Water & Sanitation Pre-test • Handout 1: Workshop Objectives 	30 mins
Water Cycle <i>Review the water cycle</i>	Group Activity and Discussion	<ul style="list-style-type: none"> • Handout 2: Water Cycle and Definitions • Flip Chart and Markers 	15 mins
Ground and Surface Water <i>Understand the difference between surface and ground water</i>	Group Activity and Discussion	<ul style="list-style-type: none"> • Clear plastic drinking cups • Sand, small pebbles & water • Piece of nylon stocking • Small rubber band • Spray bottle nozzle 	30 mins
Water Contamination & Treatment <i>Review the common contaminants of ground and surface waters; Discuss how waste water is treated</i>	Group Activity and Discussion	<ul style="list-style-type: none"> • Same materials as above • Colored powdered drink mix • Clear plastic bag, confetti • Oil, spices, dirt, coffee grounds 	35 mins
Health Effects of Water Pollutants <i>Discuss the health effects of common water contaminants; fish consumption advisories</i>	Small Group Discussion and Presentations	<ul style="list-style-type: none"> • Handout 3 a-e: Water Contaminants & Health Effects • Handout 4: <i>Should I Eat the Fish I Catch?</i> • Handout 5: <i>Do You Eat Fish?</i> 	1 hour
Fecal-Oral Disease Cycle <i>Discuss the health effects of microbial contaminants and the transmission of water and sanitation-related diseases</i>	Brain Storm, Skits and Discussion Group Activity and Discussion	<ul style="list-style-type: none"> • Rubber doggie doo, powder, plastic bug, paper cut-outs of food, doll or stuffed animal • Handout 6: Fecal-Oral Disease Cycle • Flip Chart and Markers • Roll of toilet paper 	1 hour
Water Quality and Hygiene <i>Review ways to prevent transmission of water and sanitation-related diseases</i>	Group Discussion	<ul style="list-style-type: none"> • Handout 7: Chlorination • Handout 8: Boiling • bottled water & water filter • Flip Chart and Markers 	1 hour
Garbage <i>Understand the importance of safe disposal of trash</i>	Group Discussion and Small Group Presentations	<ul style="list-style-type: none"> • Handout 9: Types of Waste • Flip Chart and Markers 	50 mins
Promoting Clean Water and Hygiene in the Community <i>Practice promoting lead education in the community</i>	Directed Role Play		45 mins
Conclusion and Evaluation <i>Complete the post-tests and evaluation forms</i>	Group Discussion	<ul style="list-style-type: none"> • Water & Sanitation Post-test • Workshop Evaluation Form 	15 mins

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CLEAN DRINKING WATER AND SAFE WASTE DISPOSAL TO PREVENT ILLNESS

(Total time: about 7 hours)

Workshop Objectives

- Understand the water cycle
- Explain the difference between surface and ground water
- Review how water can be contaminated
- Identify common water contaminants and their health effects
- Understand the fecal-oral disease cycle
- Review ways to prevent diseases caused by contaminated water
- Understand the importance of safely disposing of trash and human waste
- Describe the different types of trash and management of trash
- Practice techniques to promote clean water and sanitation issues in the community

I. Introduction

Pre-test

Time: 15 minutes

Materials: Water Pre-tests

Distribute the pre-test to the participants before starting the workshop. Explain that this is a questionnaire to help the facilitator make sure that she is presenting the information effectively and doing her job well. Ask participants to answer the questions without consulting with anyone else. If anyone has questions or needs help to answer the questions, ask the facilitator. When all have finished, collect the pre-tests and explain that you will go over the correct answers at the end of the workshop.

Workshop Objectives

Time: 5 minutes

Materials: Handout 1 (Water Workshop Objectives)

Distribute Handout 1: Workshop Objectives. Review the objectives with the group. Ask them if there are any questions or objectives

that they would like to cover that are not included on the handout. Tell the group that throughout the workshop they should feel free to ask questions whenever there is anything they don't understand, and that by the end of the day, you will try to answer all their questions as best you can.

Introductions/Group Discussion

Time: 10 minutes

Materials: Flipchart and markers

Water and Sanitation Conditions at Home

Explain to the group that you want to get an idea of the water and sewer issues that are important to them and to their community. Have each person introduce him/herself and answer the following questions. Write their answers on the flipchart and summarize.

- ? What is the source of your family's drinking water?
- ? Is your house connected to the municipal sewage system?

Water and Sanitation Conditions in the Community

Ask the participants to explain the water and sanitation conditions in the communities where they live and work.

Ask them the following questions:

- ? Are there any *colonias* or neighborhoods that don't have running water? Which ones?
- ? Where do people get their drinking water if they do not have running water?
- ? Which areas have municipal wastewater (sewerage) services?
- ? How do families dispose of wastewater in areas that do not have municipal wastewater/sewerage services?

II. Water Cycle

Explain to the participants that in order to begin understanding and discussing water problems, it is important to understand the water cycle.

Water Cycle

Time: 15 minutes

Materials: Flip chart and markers, Handouts 2 and 2a

Using a flip chart, work with the participants to draw the water cycle. Ask for a volunteer to help you to draw. To start, ask the volunteer to draw some clouds with rain falling from them. Ask the



participants what happens to the rain. Ask the volunteer to draw their responses on the flip chart. Continue to ask questions and to draw their responses on the flip chart until you have a completed a water cycle as shown in Handout 2: Water Cycle.

Explain to the participants that from the time the earth was formed, water has been endlessly circulating. This circulation is known as the water cycle. When rain falls to the earth, some of it flows along the surface in streams or lakes. This is known as surface water. Some of the rainwater is used by plants, and some evaporates into the air by the heat of the sun. The water vapor forms clouds in the sky. Depending on the temperature and weather conditions, the water vapor condenses and falls to the earth as different types of precipitation (like rain or snow). Some precipitation runs from high areas to low areas on the surface of the earth. This is known as surface runoff. Other precipitation seeps into the ground and is stored as groundwater.

Distribute Handouts 2 and 2a: Water Cycle and Definitions. Review the definitions not covered in the discussion and ask them if they have any questions.

III. Ground Water and Surface Water

Aquifer Activity

Time: 25 minutes

Materials: Clear plastic drinking cup, a handful of small pebbles or aquarium gravel, a handful of sand, water

In the previous exercise two general sources of water were noted, groundwater, and surface water. The following exercise will help us better understand ground water by becoming familiar with the term "aquifer."

Ask for a volunteer to help you. Have the volunteer fill a clear plastic drinking cup with about one inch of sand. Add about 2 inches of small pebbles or aquarium gravel on top of the sand. Explain that the cup is a model for the earth's top layers. Ask the participants to describe the spaces between the gravel and between the sand. (The gravel has bigger spaces.)

Ask the volunteer to slowly pour water into the cup until it reaches the middle of the gravel layer. Ask them where the water went? (The water has filled in the spaces between the particles of sand and rock.) Explain that **groundwater** is water that is found underground in cracks and spaces in soil, sand and rocks. When it

rains, some of the rain flows into the soil, moving through these spaces until it eventually reaches a solid layer of rock or clay (like the bottom of the cup) and begins to fill spaces of the soil. These porous layers of gravel, soil and sand are called **aquifers**. The place where the groundwater ends is called the **water table** – this can be only a foot below the ground's surface or it may be hundreds of feet down. The water table may rise after a period of heavy rains or melting snow, or it can fall after a long drought or if it is used faster than it can be replaced.

Explain to the group that drinking water and the water we use for cleaning, bathing and watering our lawns can come from either groundwater sources (via wells) or surface water sources (such as rivers, lakes, reservoirs and streams). Water is taken from the ground or surfaces, treated, and then distributed for use. Nationally, most water systems use a ground water source (80%), but most people (66%) are served by a water system that uses surface water. This is because large metropolitan areas tend to rely on surface water, whereas small and rural areas tend to rely on ground water. In addition, 10-20% of people have their own private well for drinking water.

Note: Before the training, ask the local water supplier or someone with knowledge of the area's water, the sources of water for the area where the training is being facilitated. If time permits, develop a visual or hand out that explains the water source. (For instance, in the Lower Rio Grande Valley, Texas 100 % of their drinking water comes from the Rio Grande River. In El Paso, Texas the water source comes from the Rio Grande River and the Hueco Bolson.)

Well Demonstration

Time: 5 minutes

Materials: Empty plastic drinking cup, clear plastic drinking cup filled with a handful of sand, small pebbles and water, small piece of nylon stocking, small rubber band, and a spray nozzle

If time permits, do a simple exercise to show how wells pump out ground water. Cover the bottom of the tube of a spray nozzle with a piece of nylon stocking. Hold the stocking in place with a small rubber band. Place the bottom of the nozzle into the plastic cup with sand, rocks and water (used above). Ask the volunteer to pump water through the spray nozzle into another cup or into a paper towel. Although this pump works through manual power, most real wells are powered by an electric pump. The stocking works as a screen to keep sand and gravel out of the well water.



IV. Water Contamination and Treatment

There is no such thing as naturally pure water. In nature, all water contains some impurities. As water flows in streams, sits in lakes, and flows through layers of soil and rock in the ground, it dissolves or absorbs some of the materials that it touches. Some of these materials are more dangerous than others.

Group Discussion

Time: 5 minutes

Materials: Flipchart and markers

- ? What are the main sources of water contamination?
 - Industrial and municipal wastewater
 - Industrial discharges
 - Runoff from farms, roads and yards
 - Leaking storage tanks, septic systems
 - Hazardous waste sites, landfills

- ? What are some local examples of water contamination sources?
 - local factories, farms, human behaviors, etc.

Groundwater Contamination

- ? Is ground water protected from contamination because it is underground?

It was once believed that groundwater could not be contaminated like surface water. But, in the United States alone, more than 225 different pollutants have been identified in groundwater deposits. These sources of water contamination pollute not only surface water such as rivers and oceans, but also pollute groundwater.

Groundwater Contamination Activity

Time: 10 minutes

Materials: Empty plastic drinking cup, clear plastic drinking cup filled with a handful of sand, small pebbles and water, small piece of nylon stocking, small rubber band, and a spray nozzle, colored powdered drink mix

To explain how groundwater is contaminated use the spray nozzle and plastic cup (filled with sand and rocks) used in the previous groundwater activity. Ask for another volunteer to help you. Have the volunteer sprinkle a bit of colored powdered drink mix on top of

the rocks. This is the **contaminant** or pollution. Make it rain by adding a little more water over the contaminant until it begins to color the water in the cup. Tell the volunteer to withdraw water using the "well" (spray nozzle). Notice how the pumping of the well helps to spread the contamination in the cup. Also, notice that the well (which may be a source of drinking water) drew out the contaminated water.

Surface Water Contamination

? Does anyone know what the storm drain system is?

Storm drains are the holes carved into streets and sidewalks. When rain flows over streets and other surfaces, it picks up pollutants and carries them into the storm drain system. Many people don't realize that in most cities in the U.S., storm drains are NOT connected to sewer systems and treatment plants. Storm drains are meant to prevent flooding by moving water away from streets and other structures. But, usually the water isn't filtered or treated and all the contaminants it contains eventually flow to streams, lakes and oceans. Once there, all the polluted runoff can harm fish and shellfish or make them unsafe to eat. It can also make these waters unsafe for swimming.

Surface Water Contamination Activity

Time: 10 minutes

Materials: Clear plastic trash bag, paper confetti, half a cup of vegetable oil, smelly spices, dirt or coffee grounds or other "contaminants"

Tear up about 5 pieces of paper into strips to make confetti and place it in a plastic bag. The confetti represents water in a nearby river or lake. Next, pour the oil into the bag. Tell the group that this is the oil from their recent oil change, which was then dumped into the street or left on the driveway. Next, add some dirt or coffee grounds to the mix. This represents their dog's poop that they didn't clean up after yesterday's walk. Next, add fragrant spices (like onion flakes, garlic powder, and oregano) or other materials (like powdered detergent, brown sugar or flour) to the mix. Each spice can represent a different contaminant, such as pesticides, fertilizers, cigarette butts, or trash. You can also add things like plastic bags, or pieces of hard plastic or metal. As each contaminant is added, ask participants how it could have gotten into the water. After all the contaminants have been added, pass around the bag and show the participants how polluted their water is. How could we keep out these contaminants?



Wastewater Treatment

Group Discussion

Time: 10 minutes

Materials: Flipchart and markers

? What happens to wastes and other contaminants that we pour down our drains and flushed down our toilets?

The way our modern water treatment and distribution system is designed has many flaws. Give the following example:

If I were to take a glass of drinking water, fill it with dirty toilet water, disinfect it through a complicated process that requires the use of chemicals, and then drink it, you would think I was crazy.

However, that this is how modern societies handle the treatment of water and the disposal of wastewater. At the municipal level, when we flush our toilets, the wastewater goes into pipes that make up our sewer system. The wastewater is taken away to a wastewater treatment plant, where it is treated and then disposed of.

? Where does the treated wastewater go when the plants dispose of it?

Generally, (although there are exceptions) it is disposed of by putting it into a body of water (i.e. river, ocean). Although treated and regulated by state and federal governmental agencies, it still pollutes our water, and it is one of the primary contaminants of water. This water is the same water that communities down stream will use for their drinking water. Water is taken from the river, is treated, and then distributed to households and industry, where it used and then turned into wastewater, etc., etc.

Even though the modern way of disposing of waste is problematic, it was designed in the 19th century in order to protect the public from what was once the primary source of water contamination, human excrement and organic waste. As we will discuss next, excrement or fecal material was and is largely responsible for infectious water-borne diseases.

V. Health Effects of Water Pollution

Major Water Pollutants

Time: 45 minutes

Materials: Flip chart and markers, Handouts 3a – 3e, 4 and 5

All of the sources of water contamination discussed so far may affect our health. The following exercise will help us better understand some of the health effects caused by water contamination of both groundwater and surface water sources.

Ask the participants to work in pairs. (This exercise requires five pairs or groups). Give each team one pollutant (Handouts 3a-3e), colored markers and a flip chart. Ask each team to prepare a presentation for the other participants, explaining their pollutant. Each group member must participate in the presentation.

When each team or group is finished, ask them to present their pollutant to the rest of the participants. Make it clear that they shouldn't just read aloud the information on their handout – encourage them to be creative in their presentations. After the presentations, distribute to everyone a complete set of Handouts 3a-3e: Major Water Pollutants and Health Effects.

Fishing in contaminated water

Briefly explain to the participants that fish are also affected by water pollution, and in many cases eating fish from contaminated water may be very dangerous. Fish are likely to be more affected by the contaminants than are people because of their smaller body weight. Also, some contaminants accumulate in the fat of the fish. So the longer the contamination persists in the water, the more it will accumulate in the fish.

Fish caught in local waters

It is important to check with the local health department or state environmental agency to see if any fish consumption advisories have been issued. Contact information for state agencies is listed on the EPA's fish and wildlife advisories website at <http://map1.epa.gov>. Distribute any information you learn about local advisories.

Commercially bought fish

The US Food and Drug Administration (FDA) recommends that women who are or may become pregnant, nursing mothers and young children not eat large fish that can contain high levels of methylmercury, including shark, swordfish, king mackerel, or tilefish. Some scientists think that other fish should be added to this list, including canned albacore tuna, grouper, sea trout, orange roughy and bluefish. The FDA also advises that women who are pregnant or may become pregnant to limit their consumption of other species of cooked fish to 12 ounces (about 2 meals) per



week. The recommends that since albacore ("white") tuna has a higher mercury content, pregnant women and young children should limit consumption of this fish to 6 ounces per week.

Distribute Handout 4: EPA brochure *Should I Eat the Fish I Catch?* and Handout 5: EPA poster *Do You Eat Fish?* Another EPA publication available only in English is *Should I Eat the Fish I Catch? A Guide to Healthy Eating for Women and Children*.

VI. Fecal-Oral Disease Cycle

In this section we will go into more detail about a specific water contaminant—fecal material. Excrement or fecal material is an important topic because everyone—children, adults, and even animals—defecates. Contamination from fecal material is very problematic. Since excrement and fecal material are such formal words and it's a topic that people do not always feel comfortable discussing, it is something that *promotores* must feel at ease talking about. This next exercise is a game to help the group get comfortable with “excrement” and “fecal material” without embarrassment.

Fecal material brainstorming activity

Time: 15 minutes

Materials: Flip chart and markers

Hold up a plastic or rubber "fake poop." These are available from most toy stores or magic shops. Ask one of the participants what it is. Ask for another name. Continue brainstorming until you get between 10 and 20 words to describe excrement or fecal material. Decide as a group on the word that they are most comfortable using to describe fecal material or excrement, and use it for the rest of the workshop.

Germ transmission skit

Time: 20 minutes

Materials: Rubber or plastic fake dog poop, baby or talcum powder, plastic bug, (dark) paper cut-outs of fruit and tortillas, a stuffed animal

Ask for 2 volunteers to help you.

Volunteer 1: *(She has powder on her fingers)* I've just returned from a day of work in the fields and have just finished changing my baby's diaper. I've been so busy; I haven't even had time to shower or to wash my hands! *(Holds up hands.)* Here – help me with dinner.

She lays the tortillas and fruit on the table, next to where a stuffed animal lies. On a nearby table is the pile of dog poop, sprinkled with powder, and a plastic fly. Put the fly on the dog poop and make sure it gets covered in powder. Make the fly "fly" to the tortillas, fruit and toy. Make sure that you can see the powder on the food.

Volunteer II: Okay. I'll put the food on the table. *(She puts the tortillas and food and puts them in front of some of the other participants.)*

Questions for discussion

- ? What do you see on the food? (germs, pesticide residues) How did it get there?
- ? Where will the germs go after we eat them? How will we feel after dinner?
- ? How could we keep these germs off of our food? (washing your hands, keeping out flies or protecting food, disposing of excrement safely)

Fecal-oral Disease Cycle

Time: 15 minutes

Materials: Flip chart and markers, Handout 6

Remind the group that excrement (use the word chosen by the group) is the cause of many diseases such as cholera, hepatitis A etc. Using a flip chart, draw excrement at one end of the paper and draw a mouth at the other end. Explain to the group that the reason that excrement is so dangerous and that it needs to be disposed of safely is that it causes many diseases if we swallow it. Ask the group to remember what they learned in the previous skit. Now, ask them describe other ways that excrement could get into the mouth. As the group provides answers draw their responses on the flip chart with arrows going from the excrement to the their answer to the mouth. These are some possible responses:

- Hands
- Water
- Utensils
- Food
- Flies
- Ground etc.



Remind the group as you are doing this exercise, that all people and animals defecate and that excrement whether it is from a baby, an adult or chicken is something that needs to be disposed of safely. *They should be very careful about where they choose to change a baby's diaper and where they put dirty diapers so as not to contaminate a public area. Ask them for examples of inappropriate places to change or dispose of dirty diapers.*

Distribute Handout 6: Fecal-Oral Disease Cycle.

Toilet paper activity (optional)

Time: 15 minutes

Materials: roll of toilet paper

Ask for 5 volunteers. Have them form a line at the front of the room. Hand the roll of toilet paper to the first person in line. Tell her to tear off some toilet paper from the roll, crumple it into a ball, and throw it on the floor in front of her. Then, tell her to hand the roll to the next person in line. Repeat this with the next 4 volunteers. At the end of the exercise, there should be a small mound of toilet paper on the floor.

? Have you seen mounds of toilet paper like this in public bathrooms?

? Why do some people throw the paper on the floor? Is this necessary?

Explain to the group that in some parts of the world, plumbing and sewage systems can get clogged from too much toilet paper. For this reason, they might see waste baskets next to toilets to collect the toilet paper. Even if a waste basket is not next to the toilet, people may throw the toilet paper onto the floor in order to avoid clogging the toilet.

? Do you think that throwing paper on the floor poses a health risk? Why?

? If it is necessary to keep paper out of the toilet, how can it be done more safely? How can we protect ourselves from any health hazards?

In general, most toilets in the U.S. can accept reasonable amounts of toilet paper and it is not necessary to put the paper in a separate bin. Often, clogged toilets can be fixed using a simple plunger. If a separate bin for paper is necessary, it should be lined with a plastic or paper bag in order to make disposal safer and easier. If a liner is not available, the bin should be cleaned after disposal and the person emptying the bin should wear rubber gloves and wash

his/her hands afterwards. If gloves aren't available, thorough hand washing is essential.

VII. Water Quality and Hygiene

Group Discussion

Time: 1 hour

Materials: Flip chart and markers, Handouts 7 and 8, a sample bottle of bottled water and a low-cost water filter

Shigellosis, Cholera, Hepatitis A, Giardiasis, and Cryptosporidiosis are some of the diseases that can be spread by drinking contaminated water. If not properly disposed of, the excrement of a person who has one of these diseases can contaminate the water that others use for drinking or cooking. Some of the symptoms of these diseases include stomach pains, diarrhea, vomiting, nausea and fever.

Questions for discussion

- ? How can farmworkers be exposed to these parasites and bacteria?
 - By forgetting to wash their hands after using the toilet
 - When field toilets are not kept clean, or if there is no hand washing water or soap available
 - When field toilets are not available, workers may relieve themselves in the fields, contaminating other workers
 - When drinking water is dirty, or kept in an open container
 - If there is only one communal cup available for drinking water, instead of individual disposable cups

Explain to the group that since they understand the source and transmission routes of diseases they are ready to discuss how to prevent its transmission.

Questions for discussion

- ? How can we avoid getting these water-borne diseases?
 - Handwashing
 - Safely storing our water
 - Drinking only clean water
 - Safely disposing of human and animal excrement



Handwashing

Washing our hands correctly is the first line of defense against spreading infectious diseases – not only those mentioned above, but also others like colds and flu. These are some simple steps to remember for proper hand washing:

- Wet your hands, soap them, then rub your palms and the back of your hands for at least fifteen seconds.
- Don't forget your nails and the areas between your fingers. For best results, first wash them with a brush and get under your fingernails.
- Rinse under running water from your wrist to the tip of your fingers.
- Dry your hands with a clean towel.

When is it most important to wash our hands?

- Before cooking
- Before eating
- After you touch raw meat or poultry
- After using the bathroom
- After changing a diaper
- After touching clothing, bedding, toilets, or bed pans soiled by someone who has diarrhea
- After touching dirt or animals
- Children should be supervised by adults to make sure they wash their hands well

Municipal water systems

Municipal water systems in the U.S. must comply with national standards set by the US EPA. Companies and municipalities that supply water to the public must test for over 80 contaminants that may occur in drinking water. If a contaminant is found, the supplier must treat and disinfect it. If there is a problem with the drinking water that cannot be treated immediately, the supplier must notify the people who drink its water and tell them how they should respond. If the water presents an immediate health threat, such as when people need to boil water before drinking it, the system must use television, radio, and newspapers to get the word out as quickly as possible. Each year, the water supplier must mail to its customers a water quality report that summarizes any water quality violations that occurred during the previous year.

For adults with no special health conditions, most municipal tap water is safe to drink. However, pregnant women, very young children, the elderly, people with chronic illnesses, and people living with weakened immune systems (because they have HIV/AIDS,

had an organ transplant, or are on chemotherapy), can be especially vulnerable to the risks posed by contaminated water. Those who may be vulnerable to a contaminant in the tap water should consult with a doctor to consider alternative sources of drinking water.

Private Well Water

Some people, especially in rural and agricultural areas, get their water from private wells that are not subject to the same testing and enforcement standards as public water supplies. As we discussed earlier, because of the potential contamination by fertilizer and pesticide run-off, the water in these wells may be at increased risk for nitrate and nitrite contamination.

Private water supplies should be tested annually to detect contamination from fertilizers and human or animal wastes. They should be tested more frequently and for more potential contaminants, such as radon or pesticides, if a problem is suspected.

Many laboratories are available to test water quality. Lists of laboratories certified by the state or the U.S. EPA may be available from local or state public health departments. Some local health departments also test private water for free.

There are some simple ways to disinfect water that is contaminated with some types of viruses and bacteria. One method is **boiling**. Heating water at a rolling boil for one full minute kills most germs. Be careful not to recontaminate the water when transferring it from one container to another. After the boiled water cools, put it in a clean bottle or pitcher with a lid and store it in the refrigerator. Another method is **chlorination**. Basic household bleach (unscented) will disinfect water for 72 hours. The recommended dose is 8 drops of chlorine for each gallon of water (or 2 drops of chlorine per liter of water). *Note that these methods are not effective for reducing nitrates in the water.*

Use disinfected water for drinking, cooking, or making ice. Water bottles and ice trays should be cleaned with soap and water before use. Do not touch the inside of them after cleaning.

Distribute Handouts 7 and 8: Chlorination and Boiling.

Bottled water

We should not assume that bottled water is purer or safer than most tap water. Just because a label contains words like "well water," "artesian well water," "spring water," or "mineral water" it



does not guarantee that it is any cleaner or safer than water from the tap. About 25 percent or more of bottled water is really just tap water in a bottle -- sometimes further treated, sometimes not. Most bottled water is safe to drink, but studies have found elevated levels of arsenic, bacteria, or other contaminants in a minority of bottled water brands.

Some bottle labels or caps contain information about the water's source. Bring in a bottle of water to show to the group.

Filters

When buying a water filter for the home, there are several things to consider. First, make sure to get a filter that removes the contaminants you are concerned about in your tap water. The outside packaging of the product should describe the type of contaminants it removes. Second, look for a filter that has been certified to remove these contaminants by an independent organization (like NSF). Third, maintain the filter as the manufacturer recommends in order to avoid recontaminating the water.

Bring in a water filter to show the group the different parts of the label and packaging.

Swimming pool safety

Avoid swallowing water when swimming in the ocean, lakes, rivers, or pools, and when using hot tubs. The same germs in fecal matter that contaminate drinking water can also spread diseases through water used for swimming. Chlorine in swimming pools kill these germs but chlorine doesn't work right away. Some germs can live in pools for days. For this reason it is important to take some precautions in order to keep germs and fecal matter out of swimming areas. We can protect others by being aware that germs on our bodies end up in the water.

- Don't swim when you have diarrhea. This is especially important for kids in diapers.
- Change diapers in a bathroom and not at poolside. Germs can spread to surfaces and objects in and around the pool and spread illness.
- Wash your hands with soap and water after using the toilet or after changing diapers.
- Wash your child thoroughly (especially the rear end) with soap and water before swimming.

VIII. Garbage

Group Discussion

Time: 30 minutes

Materials: Flip chart and markers, Handout 9

Explain to the participants that the trash that humans produce is generally divided into five different categories. Write the different categories on a flip chart and ask participants to give examples of each category.

- Municipal Solid Waste – garbage and trash generated by households, schools and offices
- Hazardous Waste – waste that requires special handling because it presents serious threat to human health and the environment if not properly managed
- Medical Waste – waste generated by hospitals, laboratories, morgues, and dental clinics
- Industrial Waste – waste generated by industries that is not as dangerous as hazardous waste
- Radioactive Waste – wastes that are radioactive

Distribute Handout 9: Types of Waste

Municipal Solid Waste

Even though most waste is generated by industry, the garbage generated by households has a major effect on the health of the members of that household.

- ? What can happen if household waste is not disposed of properly?
- Contamination of food and water
 - Infestation of rats, mice, flies, cockroaches, etc.
 - Spread of illnesses
 - Contamination of the environment

Ask the participants how people in their Community handle the disposal of garbage. Do they burn it? Does a garbage truck pick it up? Where does the truck take it? Do people dump their garbage in rural areas? Do they take the garbage to the dump?

Hazardous Waste

Not all hazardous waste comes from industry. We have products in our homes that create dangers to people and the environment if not properly disposed of. Americans generate about 1.6 million tons of household hazardous waste every year.



Questions for discussion

- ? What is hazardous waste?
 - A product that, because of its chemical nature, can poison, corrode, explode, or ignite easily when handled improperly. Household hazardous wastes fit into one of four categories:
 - **Toxic:** Poisonous or lethal when ingested, touched, or inhaled—even in small quantities
 - **Flammable:** Ignites easily
 - **Corrosive:** Eats away materials and living tissue by chemical action
 - **Reactive:** Creates an explosion or produces deadly vapors (e.g., bleach mixed with ammonia-based cleaners)

- ? What are some examples of hazardous waste in your home?
 - Pesticides
 - Used motor oil
 - Old car batteries
 - Leftover house paint, stains and varnishes
 - Some cleaning products
 - Old appliances (stoves, refrigerators)
 - Old televisions and computer equipment

Hazardous waste disposal

Group Activity

Time: 20 minutes

Materials: Flip chart and markers

Divide the group into 2 teams. Have one group discuss and make a list of the WRONG ways to get rid of hazardous waste in their homes. The other group will make a list of the RIGHT ways to get rid of these products. The teams can choose a spokesperson to read their list, or they can present it as a skit or some other creative way. Give a small prize to the most creative presentation.

To review the issues with the group, ask them the following questions.

- ? What are the WRONG ways to dispose of these items?
 - Pouring them down the drain
 - Pouring them on the ground or into storm sewers
 - Putting them out with the regular trash
 - Dumping them along the side of the road, in a vacant lot, etc.

- ? How can they harm us?
 - They can contaminate septic tanks or wastewater treatment systems
 - They can hurt children or pets if left around the house
 - They can hurt sanitation workers
 - They can contaminate the groundwater and wildlife

- ? What can we do to reduce these dangers?
 - Use less of these items
 - Share leftover materials with neighbors or friends, donate to charity (like old appliances and TVs)
 - Ask the trash collector or local public works department about where to take these kinds of trash
 - Recycle (old car batteries and motor oil)

We can also educate neighbors and friends about the danger that household chemicals pose to drinking water supplies. Many communities sponsor household hazardous waste disposal days to promote proper handling of waste paints and thinners, pesticides, used oil, and other hazardous materials.

IX. Promoting Clean Water and Hygiene in the Community

Role plays

Time: 45 minutes

Divide participants into groups of four. Give each group about 10 minutes to prepare one of the following role plays. Remind the participants that the most effective way to educate the community is to engage individuals in a dialogue. Encourage participants to ask many questions of the community member during their roles as *promotores* to facilitate this exchange of ideas. Note that simply lecturing to the community members is likely to turn them off. Tell them that they are welcome to use any of the materials and props that were used during the workshop. Visit each group as they are preparing to see if they have any questions. Have each group present their role play to the rest of the participants. After each group presents their role play, be sure to provide feed back. Ask the other participants to help you point out what was done well and what can be improved.

- *Promotores de salud* visit the home of a family that gets its drinking water from a well and has a septic tank. The *promotores* talk about appropriate steps to take regarding water disinfection and safe hygiene practices.



- *Promotores* visit the home of a family that doesn't have a regular trash pickup at their home. They usually burn their trash in a field behind their house. The *promotores* explain the dangers of burning trash for their health and the environment, and offer some alternative solutions for trash disposal.
- *Promotores* visit a farmworker couple and talk to them about how to practice safe hygiene in the field and avoid parasitic and other diseases.
- *Promotores* visit the home of a home mechanic and speak to him and his wife about how hazardous waste can affect their family's health. They explain how to properly dispose of hazardous waste generated by his home business and hazardous household waste.

X. Conclusion and Evaluation

Time: 15 minutes

Materials: Water and Sanitation Post-tests, Evaluation forms

Ask the group if there are any questions or comments. Distribute any materials that they will be giving to members of the community, including referral information to nearby health clinics, governmental agencies, legal services organizations and community-based organizations, and information about local resources for safe disposal of hazardous waste and recycling.

Distribute the post-test and workshop evaluation forms. Review the correct answers for the pre- and post-tests.

XI. Sources

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