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ENVIRONMENTAL HEALTH PROJECT

WASH Reprint: Field Report No. 320

Orientation to Guinea Worm Disease:
A Guide for Use in Pre-Service
and In-Service Training

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January 1991

Prepared for Peace Corps and
USAID's Water and Sanitation for Health Project
under WASH Task No. 091

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WASH and EHP

With the launching of the United Nations International Drinking Water Supply and Sanitation Decade in 1979, the United States Agency for International Development (USAID) decided to augment and streamline its technical assistance capability in water and sanitation and, in 1980, funded the Water and Sanitation for Health Project (WASH). The funding mechanism was a multiyear, multimillion-dollar contract, secured through competitive bidding. The first WASH contract was awarded to a consortium of organizations headed by Camp Dresser & McKee International Inc. (CDM), an international consulting firm specializing in environmental engineering services. Through two other bid proceedings, CDM continued as the prime contractor through 1994.

Working under the direction of USAID's Bureau for Global Programs, Field Support and Research, Office of Health and Nutrition, the WASH Project provided technical assistance to USAID missions and bureaus, other U.S. agencies (such as the Peace Corps), host governments, and nongovernmental organizations. WASH technical assistance was multidisciplinary, drawing on experts in environmental health, training, finance, epidemiology, anthropology, institutional development, engineering, community organization, environmental management, pollution control, and other specialties.

At the end of December 1994, the WASH Project closed its doors. Work formerly carried out by WASH is now subsumed within the broader Environmental Health Project (EHP), inaugurated in April 1994. The new project provides technical assistance to address a wide range of health problems brought about by environmental pollution and the negative effects of development. These are not restricted to the water-and-sanitation-related diseases of concern to WASH but include tropical diseases, respiratory diseases caused and aggravated by ambient and indoor air pollution, and a range of worsening health problems attributable to industrial and chemical wastes and pesticide residues.

WASH reports and publications continue to be available through the Environmental Health Project. Direct all requests to the Environmental Health Project, 1611 North Kent Street, Suite 300, Arlington, Virginia 22209-2111, U.S.A. Telephone (703) 247-8730. Facsimile (703) 243-9004. Internet EHP@ACCESS.DIGEX.COM.

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INTRODUCTION

Background and Purpose of the Guide

The World Health Organization (WHO) has set 1995 as the target for eradicating guinea worm disease in Africa. International aid organizations such as the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the U.S. Agency for International Development (USAID), Global 2000-BCCI, World Neighbors, and Peace Corps are directing their resources to support this eradication campaign. Due to the community-based nature of its programs, the Peace Corps is uniquely placed to contribute to this effort.

This orientation is aimed at all Peace Corps trainees assigned to endemic guinea worm areas. Its purpose is to help familiarize these trainees with the nature of guinea worm disease and to help them define the role they might play as Peace Corps volunteers (PCVs) in controlling or eradicating the disease in their communities.

The orientation to guinea worm can be used in three possible training settings:

- *Pre-Service Training:* To make all pre-service trainees aware of the problem and of what they realistically might do to help during the first few months of service.
- *In-Service Training:* To increase PCV's appreciation of the guinea worm problem and to provide them with concrete plans for initiating secondary guinea worm projects in their communities.
- *Training of Health/Water/Sanitation Volunteers:* To serve as an introduction to the disease and to the roles of trainees whose primary assignments are either guinea worm disease-control, water/sanitation, or community health education. Further training would draw upon the skill-training modules in Training Guide No. 3: *Helping Communities to Eradicate Guinea Worm.*

It is important to note that this orientation is not intended to impart specific guinea worm prevention skills to the Peace Corps trainees beyond filtering drinking water.

Orientation Goals

This orientation focuses on the causes and prevention of guinea worm disease and on how PCV's can have an impact on the problem.

There are five orientation goals:

- Explain the symptoms and transmission cycle of guinea worm disease.
- Discuss adverse social and economic effects of the disease.
- Examine the different ways guinea worm disease can be prevented.
- Describe international and host-country guinea worm eradication programs and Peace Corps's collaboration with them.
- Discuss the different ways PCVs can become involved in controlling or eradicating guinea worm in their communities.

Organization of the Training Guide

This guide contains four training sessions, which vary in length from 30 minutes to 3.5 hours. Depending on the overall training schedule, the sessions can either be given in a continuous block of time or divided into 3 to 5 blocks over a few weeks. Sessions 1 and 2 are designed to be delivered in one block, but Sessions 3 and 4 can easily be separated.

Each session has detailed trainer guidelines that provide instructions for preparing and conducting the session. The guidelines include—

- Session objectives
- Session overview
- Procedures (detailed instructions for conducting the session)
- Handouts for trainees and background materials for trainers

Using the Orientation Training Guide

The guide has been designed for trainers who are familiar with adult education methods. It may be used in pre-service *and* in-service training programs because the differing needs of both have been taken into account throughout the guide. Approaches or options are presented depending upon the group to be trained.

Trainers should be aware that these materials serve as an introduction to the skills-development training materials in Peace Corps/WASH Training Guide No. 3: *Helping Communities to Eradicate Guinea Worm*. Trainers may wish to pursue such topics as community hygiene education or surveillance using material from Training Guide No.3, if there is a strong skill-development need in the group.

When preparing for the orientation, trainers should alert outside speakers for Session 3 well in advance and provide them with guidelines for their presentations. These guidelines are found in the Session Plan.

The following schedule assumes that all four sessions would be conducted in a single block of time.

9:00 a.m.	Session 1: Introduction	30 minutes
9:30 a.m.	Session 2: Overview of Guinea Worm	60 minutes
10:30 a.m.	Break	15 minutes
10:45 a.m.	Session 3: Prevention of Guinea Worm 1 hour, 45 minutes pre-service 2 hours in-service	(varies)
12:30 p.m. (P-S)	Lunch	(varies)
12:45 p.m. (I-S)	1 hour, 30 minutes pre-service 1 hour, 15 minutes in-service	
2:00 p.m.	Session 4: Guinea Worm Eradication and the Role of Peace Corps Volunteers 3 hours pre-service 3 hours, 25 minutes in-service	(varies)
5:30 p.m.	Close	

Session 1

INTRODUCTION

30 minutes

Objectives

1. Discuss the orientation goals and schedule.
2. Clarify trainee expectations for the orientation.

Overview

This brief introductory session will help trainees understand the purpose of the orientation and its goals and schedule. Trainees will also compare their own expectations with the orientation goals.

This session includes an optional segment on viewing and discussing the video film "The Fiery Serpent" as an introduction to guinea worm.

Procedures

1. Purpose of Orientation

5 minutes

Welcome the trainees and explain the purpose of holding such an orientation during pre- or in-service training: to familiarize all PCVs in endemic guinea worm areas with the nature of the disease, and to help them identify ways to become involved in local eradication efforts.

2. Expectations

15 minutes

Most trainees will have expectations of what will be learned during this orientation. This exercise will help them determine which are likely to be met and which are not.

Write the following on a flipchart or blackboard, and ask trainees to each complete the phrase on paper:

"The most important thing I hope to learn during this orientation is...."

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Give them 2-3 minutes to write. Then ask the trainees to share their responses, recording them in turn. Be sure not to write duplicate responses on the flipchart.

3. Orientation Goals and Schedule

10 minutes

Post the orientation goals and review them with trainees. Explain that the orientation will focus mainly on the causes and prevention of guinea worm, and on identifying potential PCV activities—depending upon whether they are new or mid-point volunteers and upon their primary program assignment. State that the orientation will *not* try to develop skills in such areas as hygiene education, water-supply development, surveillance, and clinical treatment.

Compare orientation goals with trainee expectations, noting how these will be met and whether any expectations will not be addressed.

Explain the orientation schedule (i.e., one day, one hour per week, etc.).

Materials

Handout 1.1: Orientation Goals

Optional: VIEWING "THE FIERY SERPENT"

Trainer Note: If possible, procure this videotape from ICE (Peace Corps Washington) or the WASH Project before the orientation to guinea worm. (Be sure you have access to a VCR.) Present the video during the Introduction, either as part of Session 1 or at another convenient time. Try to show "Serpent" before giving the rest of the orientation because the film touches on most aspects dealt with in the sessions. Also, it is a graphic way to make people aware of the severity of the problem.

Before viewing the film

Tell trainees that they will be watching a graphic film about guinea worm disease. Although "The Fiery Serpent" was filmed in Nigeria, the effects of guinea worm vary little from country to country. Ask trainees to pay close attention to how guinea worm is transmitted, what its social and economic effects are, how to recognize it, and how to prevent it. These aspects of the disease will be explored in greater detail during the orientation.

After viewing the film

Ask for trainees' reactions to the film—what struck them the most? How did their impressions of the disease change? Next, ask them to recall different aspects of the disease presented in the film:

- How do people catch guinea worm?
- How is the lifecycle perpetuated?
- What does it look like?
- How should it be cared for?
- What are some complications of the disease?
- What are social and economic effects of guinea worm?
- What are some ways to prevent it?
- What should PCVs themselves do to prevent guinea worm?

To close the activity, ask trainees to think about how they can help with efforts to control and eradicate guinea worm disease in their communities. Explain that the orientation will examine the points seen and discussed, and that trainees will be defining appropriate roles for themselves.

ORIENTATION GOALS

The goals of the orientation are to:

1. Explain the symptoms and transmission cycle of guinea worm disease.
2. Discuss adverse social and economic effects of the disease.
3. Examine the different ways guinea worm disease can be prevented.
4. Describe international and host country guinea worm eradication programs and Peace Corps' collaboration in them.
5. Discuss the different ways Peace Corps volunteers can be involved in controlling or eradicating guinea worm in their communities.

Session 2

OVERVIEW OF GUINEA WORM DISEASE

60 minutes

Objectives

1. Recognize the symptoms of guinea worm disease.
2. Describe the life cycle of the guinea worm and how the parasite is transmitted to humans.
3. List adverse social and economic effects of the disease.

Overview

This session provides essential information concerning the life cycle of the guinea worm and how humans become infected. Volunteers must be clear about this process if they are to help their communities use effective prevention to break the cycle of infection.

The trainer will present this information by a lecturette. Afterward, volunteers will explore the effects of this debilitating disease on the community, based either on their own experiences or on common-sense deduction.

Procedures

1. Introduction

10 minutes

Ask trainees what they know about guinea worm disease. Pre-service trainees may know very little, but in-service trainees are likely to know much more. In either case, their responses will tell you what they know and will help you in conducting the orientation. Emphasize that guinea worm is a disabling parasitic disease, spread by contaminated drinking water and affecting all age groups but the very young.

Next, explain the purpose of the session and present the objectives on a flipchart.

2. Recognition and Transmission Cycle

30 minutes

Using a flipchart with key points written and a pre-drawn chart of the transmission cycle (see illustration in lecturette), give a presentation that covers signs of guinea worm and its transmission cycle.

Lecturette Notes

What Is Guinea Worm and How Do People Catch It

Guinea Worm Disease: What Is It?

- Common in parts of both Asia and Africa, guinea worm disease is one of the oldest parasitic diseases of man. In Africa, 19 countries are known to be infected, in a belt extending across the northern part of the continent. Annual estimated incidence in Africa is 3.32 million cases and the population at risk is approximately 120 million.
- It is a water-borne disease that is present in areas where drinking water is obtained from unsafe sources. Although people rarely die from guinea worm disease, it is extremely incapacitating. The pain can be so great that victims must discontinue many activities that are a part of daily life. Guinea worm is relatively easy to prevent and can be eradicated.

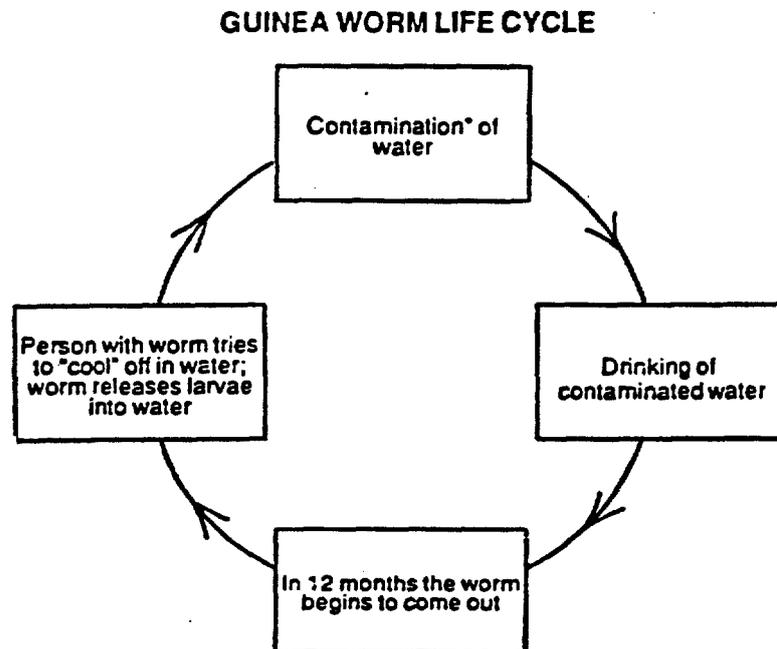
Signs of Guinea Worm Disease

- There are no signs or symptoms until the female worm matures and is ready to emerge from the skin.
- Localized swelling appears at the spot where the worm will emerge. The worm usually emerges on the lower limbs where there is contact with water, but may also emerge from other body parts: hands, breast, etc.
- Swelling is accompanied by intense burning or itching, and a blister develops in one or two days. Several days later, the blister ruptures and becomes a superficial ulcer.
- The worm may be seen emerging from the ulcer, especially when the victim wades in water.
- Tissues near the emergent site become swollen, red, and tender.

- A variety of generalized, non specific and usually mild symptoms may occur, including stomach upset, vomiting, skin rashes, fever, pain, and loss of appetite.

Guinea Worm Life Cycle

- Humans get guinea worm by drinking water containing *cyclops* (a very small water flea) that have eaten guinea worm babies or larvae.
- Once a person has drunk infested water, it takes about one year for the guinea worm to mature and move to a position where it begins to emerge from the person's body.
- When the worm is ready to emerge, a blister appears that causes painful burning. When the blister breaks, the worm comes out.
- When the affected person comes into contact with water, whether to relieve the pain, gather drinking water, or for any other purpose, thousands of tiny guinea worm larvae are released from the worm into the water.



- Once in the water, some guinea worm larvae die. Many, however, are swallowed by cyclops. Inside the cyclops, the larvae continue developing. When humans drink the infested water, they provide the final "home" where the guinea worm can develop into an adult. Over the next year, the worm matures and mates in the human abdomen and then migrates to the surface of the skin, to emerge as an adult. And so the cycle continues.

At the end of the presentation for pre-service trainees, mention that there is no specific way that guinea worm can be cured. The disease will run its course once a person has been infected. However, there are some ameliorative measures that one may take:

- Clean the wound daily and keep it covered.
- Rinse the wound daily with water.
- Prevent tetanus with a shot.
- Avoid immersing the affected limb in a water source.

Note: Conduct a slightly lengthier discussion about treatment with in-service trainees at the end of Session 3: Prevention.

3. Adverse Social and Economic Effects

15 minutes

Explain that the period of pain, weakness, and suffering from guinea worm disease can last up to three months. Ask trainees what adverse social and economic effects this period of disability can have. Ask pre-service trainees to base their thoughts on what they have learned about the symptoms and causes of guinea worm. Ask in-service trainees what effects they have noticed or heard about in their communities or schools. List the responses on a flipchart. Include the following if they haven't been mentioned by the group:

- high absenteeism from school
- lower agricultural productivity
- mothers who can't adequately care for their children
- loss of income when affected women can't take produce to market
- dependency of afflicted person upon social support system

Optional**30 minutes**

If possible, invite community people who are current or past victims of guinea worm to talk to the trainees about how it has affected their lives. Plan an informal meeting either during this session or at another time more convenient to your guests. Ask the trainees to identify two or three questions they would like to ask about the effects of guinea worm, and share these with the guests beforehand.

4. Wrap-up**5 minutes**

Ask the group if they have any questions concerning symptoms, transmission, or effects of guinea worm. Close the session by pointing out that the adverse effects are all the more poignant since guinea worm disease is easily preventable. Tell trainees that in the next sessions they will discuss ways guinea worm can be prevented, and how PCVs can help families and communities do so.

* Distribute *Handouts 2.1 and 2.2*. Either distribute *Handout 2.3 (vocabulary list)* here, or share it with language instructors to use in language class.

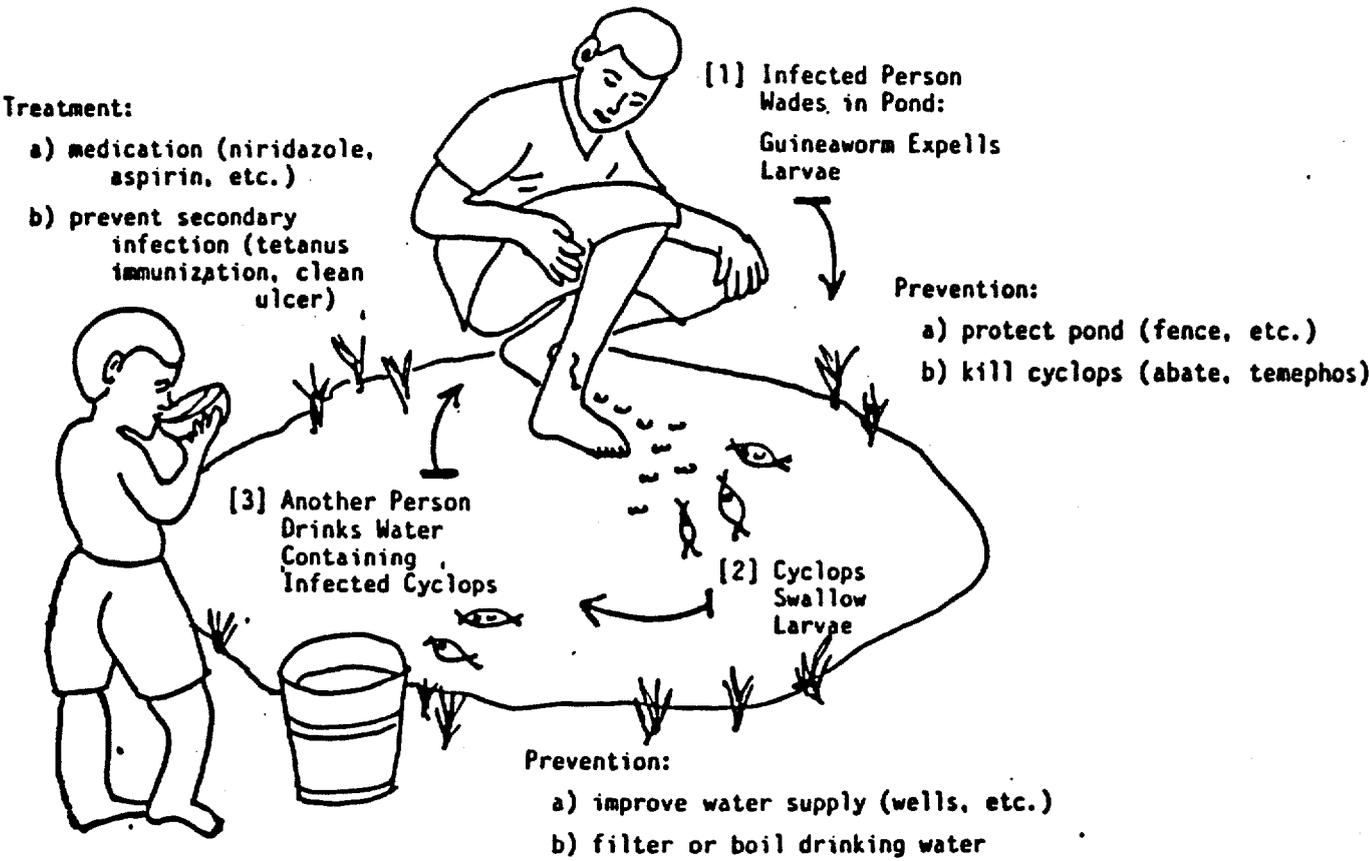
Materials

Handout 2.1: Guinea Worm: Cause, Prevention, and Treatment

Handout 2.2: Social and Economic Effects of Guinea Worm

Handout 2.3: Guinea Worm Vocabulary List

GUINEA WORM: CAUSE, PREVENTION AND TREATMENT



SOCIAL AND ECONOMIC EFFECTS OF GUINEA WORM

While guinea worm is rarely fatal, the pain and suffering it causes seriously deteriorates the quality of life of the poor people it infects. Its crippling effects usually occur during the height of the peak agricultural labor season, and have enormous negative impact on agricultural productivity. A UNICEF-funded study from a rice growing area of Nigeria in 1987 estimated that the annual losses in profits from rice production in an area of 1.6 million people was over \$20 million. A WASH study of 100 villages in Burkina Faso with a total population of 50,000 estimated agricultural losses to be in excess of \$216,000. Global estimates of agricultural losses produced by the National Academy of Sciences reached as high as \$3 billion annually. The costs of this disease in terms of lost agricultural production are great enough to warrant the attention of national and international health agencies. But these are not the only negative effects of the disease.

Guinea worm also has a profound effect on school attendance. In endemic areas in southwestern Nigeria, pupils missed up to 25 percent of the school year compared with only 2.5 percent in nonendemic areas. Other studies in Nigeria estimate absenteeism due to guinea worm as high as 33 percent, and conclude that repeated absenteeism year after year seriously handicaps a student's chances of doing well in school.

The WASH project has analyzed the impact of guinea worm on the lives of women in two areas of Nigeria. The study found that the disease had a definite and observable negative impact on the women which affected their abilities to supplement their family incomes, care for themselves and their children, and perform normal household duties. For example, in one area, more than half of the children defaulting on their immunizations did so because their mothers were unable to leave their homes and bring them to the clinic.

The study was based on two areas of Nigeria where guinea worm is endemic: Idere Town in Oyo State and several small villages in Asa and Moro Local Government Areas in Kwara State. Mothers of children aged 24 months and younger were the primary target. Focus group interviews helped determine the parameters for study and provided ideas for an in-depth interview guide. Forty-two women who were suffering from guinea worm took part in the in-depth interviews. Their experiences with guinea worm were developed into case studies. Careful analysis of the 42 case studies produced the study results—that is, trends and patterns in four major variables: self-care functions, child-care duties, domestic activities, and economic pursuits.

Thirty-eight percent of the mothers were bedridden during their bout with guinea worm, while 28 percent could move only with the use of a stick. Self-care suffered greatly during this period. Most experienced loss of appetite and had difficulty bathing and moving outside to defecate. Most of the women (71 percent) could not perform normal domestic chores at

some point in their illness, while 24 percent were limited to cooking and other home-based activities.

In terms of child care, all mothers tried to continue breastfeeding but one had to stop due to a guinea worm ulcer on her breast. Of 15 who defaulted on their babies' immunizations, eight were directly the result of guinea worm. Of 15 ulcer episodes among the children, six received no treatment because of their mothers' guinea worm infection. The rest were given mostly home treatment or drugs bought in local shops.

Women in the study communities played a major role in generating income for the family, especially for the children. Most women could not continue with their regular work (farming, trading, crafts) during guinea worm. Those who could work estimated income loss averaging US \$70 during their illness. This compares to an annual per capita income of US \$125 for the area.

Disabled mothers received help from family and friends but, where guinea worm prevalence was high, less help was available. Even in lower prevalence areas, economic activities took well family members out of the house, leaving the sufferer and her child alone.

The study reached six major conclusions:

- Guinea worm has a definite and observable negative impact on women.
- The case study approach to the research was appropriate for highlighting the dynamic process of guinea worm suffering and disability.
- There was an observable impact from maternal disability on some children, but greater long-term effects are likely.
- The financial impact on mothers, the children, and families is large and affects nutrition.
- Social support systems are severely taxed when guinea worm prevalence is high.
- Even in areas where there is less guinea worm, traditional helping networks have been weakened due to economic pressures.

Policy implications of the study include the need to link guinea worm control and water supply projects closely with child survival programs. Women's participation will be essential in such programs. Guinea worm control is an investment that will yield dividends in maternal health and family economic well being.

VOCABULARY LIST FOR GUINEA WORM TRAINING

Guinea worm
transmission cycle
vector
cyclops
pond
contamination
larvae
sore/wound
prevention
treatment
bandage
tetanus
infection
disability
blister
water filter
clean
cloth
water jar
eradication
surveillance
surveys
surveillance forms
community health committee
health education
beliefs
practices/behaviors
safe water supply

Session 3

PREVENTION OF GUINEA WORM

1 hour, 45 minutes (pre-service)

2 hours (in-service)

Objectives

1. Discuss the different ways guinea worm disease can be prevented.
2. Demonstrate how to filter drinking water.

Overview

This session consists of two distinct parts, which can be done separately if there are time constraints. The first part explores various prevention strategies for guinea worm, which the trainees then analyze according to whether they are cost-effective, convenient, and feasible. In-service trainees also review available treatment measures and PCV limitations in this area.

The second part features a demonstration on how to filter contaminated water through cloth. This is a skill that all volunteers should be able to apply in their own homes and communities, regardless of assignment or length of service. The demonstration will be more effective if trainees have had a chance to visit a contaminated water source and collect the water themselves.

Procedures

1. Introduction

5 minutes

Tell the trainees that given the lack of curative treatment for guinea worm, prevention is the only approach to controlling the disease. PCVs should be knowledgeable about prevention, not only to help their communities but also to preserve their own health.

Present session objectives on a flipchart.

2. Prevention

30 minutes/pre-service
45 minutes/in-service

Refer to the flipchart showing the guinea worm transmission cycle and ask a volunteer to recap how guinea worm is transmitted.

Ask the group how they think the disease can be prevented (i.e., how the cycle can be broken) or what ways they know that it can be prevented. List the responses on flipchart, and make sure they include the following:

- Protect water sources from infected people.
- Filter drinking water through cloth.
- Sterilize contaminated water by boiling.
- Improve community water supply.

Discuss chemical treatment of infected ponds with *Abate*, but mention that this is not an appropriate Peace Corps activity.

Emphasize that surveillance of cases is the first step to prevention. Understanding who has the disease and how it is being transmitted facilitates the promotion of both individual and community-wide prevention.

Make sure everyone understands each prevention method. Then proceed with either Option A: Pre-service or Option B: In-service, as follows.

Option A: Pre-service (20 minutes)

Proceed with a large-group discussion: Go over each point on the list and ask the group what they think cost/convenience pros and cons might be. Make notes next to the listed methods.

Option B: In-service (35 minutes)

Proceed with a small-group task: Tell the group that, having discussed the recognition and causes of guinea worm, the next area is prevention. Ask the group to identify the ways to prevent guinea worm and record their responses on a flipchart. If the group leaves out any important prevention options, add them to the list. Make sure that the list includes the following prevention methods:

- Protect the water source from people infected with guinea worm.
- Sterilize contaminated water by boiling.

- Use cloth filters.
- Improve community water supply (e.g., dug wells, boreholes, rainwater storage).

Note: Adding alum to water does not kill disease organisms; it only settles particulate matter.

Be sure everyone understands each method.

After the group has brainstormed a list of prevention methods, choose the four to six most important methods with the group. Divide the trainees into small groups of four or five (no more than four small groups) and assign one or two prevention methods to each small group. Give the group the following directions (write them on a flipchart):

- List the pros and cons of each prevention method assigned to your group.
- Discuss the pros and cons of using each prevention method in your own community according to—
 - cost
 - convenience
 - long-term effectiveness
 - acceptability to the community
 - obstacles to implementing this method
 - availability of materials

Trainer Note: Writing reports on a flipchart takes groups up to ten minutes. An alternative is to have the trainer jot notes on a flipchart as the group gives reports verbally. Writing on the charts themselves, however, does help the group internalize what they wrote.

Small Group Reports

(10 minutes/both groups)

Each small group should select a spokesperson to report to the full group. The total time allowed for each group presentation is ten minutes: five minutes for the presentation, five minutes for discussion. Be sure to monitor the time carefully so this activity does not take too long. After each report, ask the others if they have any questions or clarifications.

After all four small groups have reported, ask the full group which option they prefer. Their opinions should be supported by reasons. Summarize by indicating which are temporary and which are long-term measures.

3. Treatment

25 minutes

Tell the trainees that the final aspect of this session is a brief overview of guinea worm treatment. Emphasize that unless a volunteer is a health professional, it is inappropriate and even risky for them to get involved in treating cases. However, volunteers are often asked for advice, and thus may have opportunities to provide health education about guinea worm prevention and care. Volunteers should act as guinea worm resources or counsellors in their communities.

Ask the trainees what methods they are aware of for treating guinea worm. If they do not include the following, add them to the list:

- Clean and rinse the wound daily, and cover with a clean bandage or cloth.
- Prevent tetanus through immunizations.
- Remove the worm with a small stick.
- Lessen physical discomfort.

Ask the group if they know of any traditional methods of caring for guinea worm. Ask them what kind of counsel they can give to guinea worm sufferers in addition to the above. Make sure the list includes the following:

- If you have guinea worm, do not go into the drinking water source.
- Do not cover your wound with dung, roots, or palm oil.
- If you begin now to filter your drinking water, you will not have guinea worm next year.
- If you get a high fever, or if your wound becomes very swollen, see a doctor or nurse as soon as possible. If you are unable to go, send someone in your family to bring the medical help to you.

Ask the group these questions in order to clarify the major aspects of treatment:

- Are there any diagnostic tests to detect the presence of the parasite before it emerges?
(no)
- Are there any drugs that will kill the worm before it emerges? (no)
- Can a person develop immunity to guinea worm? (no)
- How many worms can infect a person at the same time? (multiple)

As a wrap-up to this session, emphasize the point that no medicine can cure guinea worm, once ingested. All that can be done for afflicted people is to prevent infection and make them more comfortable.

Distribute *Handout 3.1: Prevention of Guinea worm*, to trainees.

4. **Filtering Contaminated Water: Demonstration** **30 minutes**

Trainer Note: This demonstration can be done as a separate session, depending on time constraints. However, it is important that it be done at some point during the orientation since it teaches a skill that volunteers may use at any time in their communities. If the orientation is an introduction to a longer skill-development workshop, this demonstration might take place during the module on improving water supply.

Introduce the demonstration by telling the group that they will watch and then do a simple but effective procedure for filtering contaminated water. Refer to the flipchart showing the transmission cycle, and ask how filtering interrupts the cycle (by preventing the ingestion of the intermediate host—cyclops).

Demonstrate how to filter contaminated water through a cloth or other filter if a standardized one is being promoted. Discuss the difference between types of cloth: it is important to use a tightly woven cloth, such as the one being used by the guinea worm program, to prevent the cyclops from passing through. If you are unsure about the weave, double the cloth you are using.

You will need the following for the demonstration:

- Bucket of contaminated water, preferably collected by the trainees during an outing to the water source

- Local containers used for water storage
- Light-colored, fine-mesh cloth or a monofilament cloth sieve or other filter being promoted by the guinea worm program
- String, elastic, or local fiber used to attach cloth to mouth of storage jar
- Cup for pouring
- Magnifying glass, if available

Attach the cloth to (or place the filter over) the mouth of the water jar with string or elastic. Be sure there is a slight downward dent in the cloth.

Then pour the water by cupfuls into the jar through the cloth or filter. Explain the need to always have a "clean" side and a "dirty" side of the cloth. This prevents filtered cyclops from entering the water if the cloth is reversed and reused.

Have the trainees use the magnifying glass to examine the cloth or filter for organisms.

After filtering, remove the cloth or filter and clean it by washing it with soap and water. Dispose of the contaminated water safely, and hang the cloth or filter to dry for the next day's use.

After the demonstration, ask one or two trainees to repeat the demonstration and explain every step.

Distribute *Handout 3.2*.

5. Wrap-up

15 minutes

Ask the group what they learned about guinea worm prevention; get a few examples. Make the point that PCVs can be particularly helpful by modeling and demonstrating guinea worm prevention. Tell the group that the next session will focus on specific ways that volunteers can become involved in guinea worm control efforts.

Materials

Handout 3.1: Prevention of Guinea Worm

Handout 3.2: How to Filter Contaminated Water

PREVENTION OF GUINEA WORM

Preventive measures can be aimed at different points in the life cycle of guinea worm. Some are temporary measures, while others are longer lasting. In an endemic area there may be many ponds where people can become infected, especially if people are often moving among the different towns, villages, markets, and farms in the district. A good control strategy must take account of the various sources of infection. Different preventive measures are listed below.

1. An infected person can be kept away from community ponds. Social pressure and support are needed. Non-infected persons must help those with the disease to collect water for their domestic needs. Community members may take turns guarding the pond to keep out those with open guinea worm ulcers or blisters. Ponds can be protected by fences. These are only temporary or partial measures.
2. Chemicals can be used to kill the cyclops. Temephos (Abate) is safe to use if applied correctly by a trained health worker or community volunteer. The water should be acceptable for drinking a few hours after the chemical has been applied. Repeat applications are needed every six weeks. This method will fail unless regular supplies of the chemicals are available to every village and are used properly.
3. Boiling the drinking water kills cyclops and guinea worm larvae, as well as other germs. This is a time-consuming and expensive procedure which is socially unacceptable to most villagers.
4. Filtering water through clean cloth removes cyclops. The mesh size of the cloth must be small and uniform or else some cyclops may pass through. Monofilament nylon or polyester cloth is ideal for making filters, but unless the filter is used every time the water is collected, it will not protect. Also, the filter may eventually develop holes and tears and need replacement. Filtering is a good temporary measure and is also useful in villages that are too small to afford a well.
5. The best and most long-lasting solution to guinea worm is a permanent, clean source of water. The choice of a dug well, borehole, protected spring or tap water will depend on local geography, finance, and political realities. The benefit in this method is that it offers protection from many waterborne diseases, not just guinea worm.
6. Treatment is often considered a control measure for many diseases, but this is not very effective for guinea worm.

A comprehensive guinea worm control strategy will probably require a combination of the above methods. Unless a convenient and plentiful supply of water is available to everyone in a community, prevention will depend on a clear understanding by everyone in the community on how guinea worm is transmitted and on the adoption of preventive behaviors. A control program must, therefore, include hygiene education to promote this understanding and these behaviors.

HOW TO FILTER CONTAMINATED WATER

You will need:

- Water from a source infected with guinea worm
- Water storage jar or other large container
- Piece of light-colored fine mesh cloth, or
- Monofilament cloth sieve or other filter being promoted by the guinea worm program
- String, elastic, or fiber used to attach cloth to mouth of storage jar
- Cup for pouring

How to filter:

Attach the cloth to (or place the filter over) the mouth of the water jar with string or elastic, making sure there is a slight downward dent to the cloth.

Then pour the water by cupfuls into the jar through the cloth or filter. You should always have a "clean" side and a "dirty" side of the cloth. This prevents filtered cyclops from entering the water if the cloth is reversed and reused.

After filtering, remove the cloth or filter and clean it by washing it out with soap and water.

Dispose of the contaminated water safely, and hang the cloth or filter up to dry for the next day's use.

Session 4

GUINEA WORM ERADICATION AND THE ROLE OF PEACE CORPS VOLUNTEERS

3 hours (pre-service)

3 hours, 25 minutes (in-service)

Objectives

1. Describe international and host country guinea worm control programs and the Peace Corps role.
2. Discuss different ways PCVs can become involved in controlling or eradicating guinea worm in their communities.

Overview

This session also consists of two parts: the first is a presentation by up to three guest speakers from international agencies, the host government, and/or Peace Corps on efforts to eradicate guinea worm. The second part consists of an exercise in which the trainees identify specific ways they can become involved in these efforts. This exercise is tailored to meet either pre-service or in-service needs.

If the presentations are long enough, this session can be given in two parts. If no guest speakers are available, the trainers will need to provide an overview of the eradication efforts using the background materials included here, as well as information gathered in-country. This overview would introduce the next part of the session.

Procedures

1. Introduction

10 minutes

Tell the group that in recent years, the focus on guinea worm eradication has gained momentum in the international health community. In fact, the World Health Assembly has passed a resolution targeting eradication by the end of 1995. This resolution is largely a result of efforts related to the International Drinking Water and Sanitation Decade. WHO, CDC, and concerned governments realize that eradication

Sanitation Decade. WHO, CDC, and concerned governments realize that eradication can soon be achieved if the water supplying afflicted communities is improved and if community members are taught and encouraged to use simple prevention measures.

Present the purpose of this session and the objectives. Then introduce the guest speakers by name and organization.

2. Presentations

60 minutes

The guest speakers each give a 10 to 15-minute presentation on their agencies' involvement in guinea worm eradication. The trainers should provide the following outlines to the guests well in advance of their visit, and ask them to use the outlines to guide their presentations. Encourage the guests to use handouts, maps, tables, charts, flipcharts with key points, etc.

Host Country/International Programs

- Worldwide/local geographical distribution of guinea worm
- Basic epidemiological information on the disease (numbers affected, seasonality of transmission and incidence, etc.)
- Background/history of the program
- Overall program goals, long-term and intermediate objectives
- Main program strategies, specific activities
- Surveillance, reporting, and evaluation methods
- Collaborating organizations and ministry personnel
- Community organization and participation
- Successes and problems encountered to date

Peace Corps

- History of Peace Corps involvement worldwide and nationally
- Peace Corps/Washington mandate to assist guinea worm eradication efforts
- In-country program development
- Program objectives and strategies
- Guidelines and limitations to PCV involvement
- Case studies of PCV activities, including successes and problems

After the presentations, allow a 10-minute question and answer period. Thank the guests for the whole group.

3. Role of Peace Corps Volunteers

30 minutes/pre-service

45 minutes/in-service

Pre-service Trainees

Ask trainees what things they might be able to do as new PCVs. Stress that the PCV role is mostly promotional and educational, and cannot rely much on outside resources. Stress also that as new PCVs they will spend the next few months getting to know their communities, families, and primary jobs.

List their responses. Narrow the list to those items that are truly feasible and reasonable for new PCVs, such as surveillance and water-filtration activities. Community hygiene education, water supply improvement, and initiation of a school guinea worm curriculum are activities to consider as secondary projects after the first six months of service.

For each major activity, ask the trainees what specific things they might do, and note their ideas next to the activity. The list should look something like this:

Surveillance

- Find out if there is any guinea worm in my community and in neighboring communities.
- Find out if there is any ongoing guinea worm activity and who is involved.
- Help with any ongoing surveillance activity.
- Suggest surveillance activities if none are ongoing.
- Count cases in my community, if appropriate, with a member of the community or with school teachers or pupils.
- Develop a form, if none exists, for keeping track of cases.
- Identify contaminated water sources.

Water Filtration

- Use local water storage jars in my own house.
- Filter my own drinking water (be a role model).
- Teach my neighbors and friends why and how to filter water.
- Teach the kids who come to my house why and how to filter water.
- Organize a water-filtering demonstration in my school (for teachers or for pupils).
- Talk to my friends, neighbors, and colleagues about guinea worm; find out where they think it comes from.
- Talk about the connection between guinea worm and contaminated water to friends, neighbors, and colleagues.

Explain to trainees that activities such as promoting community hygiene education programs, improving water supply, and carrying out a school guinea worm program involve fairly specific skills and resources, and are best done after PCVs have participated in an in-service training later in their service.

In-service Trainees

Ask trainees what they see as feasible activities or secondary projects to do in their communities or schools. List their responses and make sure they include surveillance, community hygiene education, water filtration, protecting water sources, improving water supply, and initiating a school guinea worm program.

If possible, invite current PCVs to describe their roles in guinea worm control as primary or secondary projects.

For each major activity, ask what a volunteer can specifically do. List the group's responses. In addition to the items listed in the previous section for pre-service trainees, these lists should include the following:

Protecting Water Sources

- With community, build bridges or platforms to prevent infected persons from entering source.
- Counsel afflicted persons not to enter water source.
- With teachers, PTA, and community, prevent children from playing in drinking water sources.

Community Hygiene Education

- Raise awareness in community of link between guinea worm and contaminated drinking water.
- Help community organize a guinea worm committee.
- Work with committee to carry out educational activities: for example, counselling affected persons about such things as treatment, protecting the water source, filtering or boiling drinking water in the home, and avoiding drinking contaminated water away from home.
- Work with health center staff to carry out education sessions on prevention and treatment of guinea worm.

Initiating a School Guinea Worm Program

- Give classes on causes and prevention of guinea worm.
- Organize a student/teacher guinea worm committee.
- Help students organize community education programs: water filtering demonstrations, skits about transmission of guinea worm, campaigns to protect water source from infected persons.
- Organize surveillance activities with students: polling neighborhoods for cases, finding out whether people filter water at home, what source they use for drinking, etc.

Improving Water Supply

- Through the guinea worm or health committee, organize the construction of protected wells, rainwater catchment systems (cisterns), or capped springs. Note that these activities require funds and technical skills.
- Identify alternative uncontaminated drinking water sources.

When the lists are complete, have them typed up, reproduced, and given to trainees, along with other resource material such as lists of organizations with technical expertise and/or resources, local program documents, etc. Distribute *Handout 4.1: Sample Forms* and review it with the trainees.

4. Group Plans

60 minutes

Ask trainees what they consider were the most important things they learned about—

1. The transmission cycle of guinea worm.
2. The social and economic effects of the disease.
3. How to prevent guinea worm disease.
4. Guinea worm eradication programs.
5. Actions that Peace Corps volunteers can carry out.

If the trainees represent different programs, ask them to break into small groups by program and identify the guinea worm activities most appropriate to their program. Tell them to identify some first steps they can take to initiate these activities. After fifteen minutes, reconvene and ask each group to present its work.

If the trainees represent a single program, ask the whole group to identify priority activities and first steps. Note these on a flipchart.

5. Individual Plans and Orientation Wrap-up

30 minutes

Ask trainees to reflect upon what they as individual volunteers feel they can do in their communities and upon the first steps they intend to take once they return (or arrive). Either ask for one or two volunteers to share their plans with the group, or suggest that trainees pair up and share plans.

Materials

Handout 4.1: Sample Forms for Guinea Worm Surveillance

Background Document 4.1: Overview of Guinea Worm Disease

Trainer Notes: The organizers of this orientation need to spend some time briefing the guest speakers before they make their presentations. Preferably, these briefings should take place a few days before the orientation and should include the following points:

- *Overall purpose and goals of the Guinea Worm Orientation*
- *Specific directives of Session 4*
- *Length of the presentation (no more than 10-15 minutes each)*
- *Outline of the presentation (see Step 2 of Session 4 for details)*

If there are to be more than three speakers, the session should be divided into two separate sessions so that no one session takes too long.

SAMPLE FORMS FOR GUINEA WORM SURVEILLANCE

INFORMATION FORM

- District _____
- Name of village _____
- Number of inhabitants _____
- Total number of cases of guinea worm reported this year or last _____
- Is there a school in the village?
_____ No _____ Yes, how many?
- How far away is it? _____
- Number of students in the school _____
- Number of students with guinea worm this year or last year _____
- Is there a health center?
_____ Yes _____ No
- How far away is the nearest health center? _____
- Is there a social center in the village?
_____ Yes _____ No
- What are the water sources used in the village?
_____ Pond
_____ Dam
_____ Creek or River
_____ Well _____ Number
_____ Cisterns _____ Public _____ How many?
_____ Pumps _____ How many?

GUINEA WORM RESEARCH - _____ DISTRICT

VILLAGE EVALUATION

Name of Village: _____ County: _____

Trainer(s): _____ Date: _____

Ask the leader:

1. Approximate number of concessions in village: _____

2. Approximate number of people: _____

3. Approximate number of people with guinea worm last year: _____

4. In your opinion, what causes guinea worm? _____

5. In your opinion, can one prevent guinea worm?
_____ Yes _____ No _____ I don't know
If yes, how? _____

6. How is guinea worm treated in this village? _____

7. What water points are used by the village inhabitants during the year?

Type of water point	Does it dry up? (yes or no)	If yes, during which months?	Potential source of infection? (yes or no)

VEUILLEZ ENUMERER LES VILLAGES QUI SONT SERVIS PAR L'ECOLE

Village	Population	Nbre de cas de ver de Guinée au cours de l'année 1984-85	Nbre et type de source(s) d'eau	Type de Pompe	Présence d'un comité de santé dans le village	Les services gouvernementaux travaillant dans le village (Indiquez nombre de dispensaires, agents sociaux, maisons familiales)

OVERVIEW OF GUINEA WORM DISEASE

Dracunculiasis (guinea worm disease) is a disabling infection caused by the parasite Dracunculus medinensis. Infection is acquired by persons who drink water that contains cyclopid copepods or, less technically, water fleas that have ingested D. medinensis larvae. Infected persons remain free of symptoms until about 1 year postinfection when adult female worms in the connective tissue provoke the formation of a painful blister in the skin. The blister rapidly becomes an ulcer through which the worm protrudes to release larvae when stimulated by contact with water. In about 90% of cases the worm emerges from a lower limb. The 70- to 100-cm long worm dies and must be extracted, usually by winding a few centimeters on a stick each day, a very painful process which may last many weeks. Disability from infection lasts for weeks to months, depending on the number of worms and where they emerge.

The annual incidence is estimated at 5 to 10 million cases per year, and approximately 140 million people are at risk. Dracunculiasis occurs in West Africa, and extends across Sahelian countries into East Africa (a total of 19 countries). In Asia dracunculiasis is endemic in Pakistan and western India.



Areas in which Dracunculiasis is reported or probably exists

Transmission usually occurs seasonally, during the dry or rainy season (depending on the local ecology), and the impact on the productivity of agricultural workers may be dramatic. Incidence is highest in the 19- to 40-year old age group. Impact on school attendance is also substantial. Infected persons do not develop immunity. There is no known animal reservoir. Neither effective drugs nor vaccine exist.

Dracunculiasis was declared eliminated from southern USSR (Turkestan) in the 1930s, from Iran in the 1970s, and from Tamil Nadu State in India in 1984. During the International Drinking Water Supply and Sanitation Decade (1981-1990) a major initiative to eradicate dracunculiasis has steadily gained momentum. The ultimate goal is global eradication of dracunculiasis. The intermediate goal is the elimination of endemic dracunculiasis from each endemic country. This goal is planned in the World Health Organization's (WHO) Global Medium Term Program for Parasitic Diseases (covering the period 1984 to 1989; PDP/MTP/83.3); it was declared in April 1981 and November 1987 by the Steering Committee of the International Drinking Water Supply and Sanitation Decade; and it was proclaimed in the resolutions "Elimination of Dracunculiasis" (adopted by the World Health Assembly in 1986, WHA39.21), and "Eradication of Dracunculiasis" (adopted by the Regional Committee for Africa in 1988, AFR/RC38/19/WP17).

There is a growing realization that dracunculiasis can be eradicated soon. The methods of control are simple. Affected populations can be educated about the origin of this disease and what they can do to prevent it, and can be provided with new sources of safe drinking water. However, before implementation of control, the location and incidence of dracunculiasis must be determined and appropriate planning for the implementation and monitoring of control interventions must take place.