HELPING COMMUNITIES TO ERADICATE GUINEA WORM:

A TRAINING GUIDE

GUINEA WORM
ERADICATION
PROGRAM

PEACE CORPS
OFFICE OF TRAINING AND PROGRAM SUPPORT

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HELPING COMMUNITIES TO ERADICATE GUINEA WORM
A TRAINING GUIDE

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

by

William R. Brieger

December 1992

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CONTENTS

DEVELOPMENT OF THE GUIDE

This document represents one of several activities undertaken by the U.S. Peace Corps, with assistance from the U.S. Agency for International Development (USAID), to combat guinea worm disease in African countries in which it is endemic. This guide was developed under the auspices of the Water and Sanitation for Health (WASH) Project of USAID. The first draft was prepared in 1990 and pilot tested in 1991 with Peace Corps trainees for Nigeria. This revised version has been adapted for use in both preservice and in-service training of Peace Corps volunteers, and can also be used for training mid-level (district) health and development staff in countries where guinea worm is endemic.

ABOUT THE AUTHOR

William R. Brieger is a Reader (Associate Professor) in Health Education at the African Regional Health Education Centre, Department of Preventive and Social Medicine, University of Ibadan, Nigeria. He has been actively involved in guinea worm research and community projects since 1978, including the development of community health education, health worker training, and village-based surveillance programs.

GUIDELINES FOR TRAINERS

Background

Guinea worm (dracunculiasis) is a waterborne helminthic (parasite worm) disease that has plagued the neglected rural areas of Africa and southern Asia for centuries. As a result of the International Water Supply and Sanitation Decade (1981-90), guinea worm has received increased attention; it has become the test disease for the success of the decade since it is solely transmitted through unsafe water. Beginning with India, countries in which the disease is endemic have begun to set target dates for its elimination, aiming for global eradication in the 1990s.

Guinea worm is not a typical communicable disease. It cannot be eliminated by using drugs or vaccines. Personal hygiene helps (e.g., filtering drinking water), but it is not the total solution. Guinea worm will only be eliminated when poor, remote communities work together with various agencies toward achieving local development, including especially improved and safe water supplies.

The Peace Corps has a long history of involvement in community education and action in rural areas. Thus it is only natural that Peace Corps volunteers (PCVs) play an important role in community efforts to eliminate guinea worm. This training guide, therefore, provides users an opportunity to merge skills in community assessment, education, planning, and action with knowledge of disease surveillance and guinea worm control measures, thereby enabling them to tackle this stubborn and disabling parasite.

Overall Workshop Goals

A five-day workshop has been designed to address the needs outlined above. This is a short period for such a large task, but it is still a sizable amount of time for participants to be away from their work sites.

The 10 workshop sessions are geared to provide both knowledge about guinea worm and the skills to control it. The sessions are intentionally geared to activities that could fit normally into the daily routine of a PCV involved in community service—e.g., checking records when visiting clinics or schools to identify the number of people suffering from the disease, or holding talks about guinea worm with community groups with whom the PCV usually works.

The workshop is not intended to transform participants into technical experts on water supply projects. Many agencies, including UNICEF, UNDP, the World Bank, bilateral aid organizations, and national ministries, are already committed to various large- and small-scale water supply projects. *The biggest need in guinea worm control is not the supply of useful* *technologies, but rather the need to involve people and their communities in using the available technologies to promote their own health.*

Toward this end, participants are expected to achieve the following goals by the end of the workshop:

- Explain the symptoms, cause, preventive measures, disability, and treatment associated with guinea worm disease.
- Describe the global and national guinea worm eradication programs and the roles of Peace Corps volunteers in this effort.
- Define the process of and topics for community assessment as a basis for starting a guinea worm control program.
- Differentiate the types of community surveillance procedures and analyze results of surveillance studies.
- Design a plan for community surveillance and data gathering, including household survey, observation of water sources, review of local records, and focus group discussion on local beliefs.
- List, design, and use appropriate health education techniques to teach individuals and groups about guinea worm prevention.
- Outline the steps involved in organizing community health education and mobilization for guinea worm control.
- Develop a local action plan that incorporates the issues covered in this workshop and that can be applied by the PCV in the field.
- Identify and propose solutions for common program management problems.

The Trainees

This training guide was initially developed with one main target group in mind: Peace Corps volunteers in need of in-service training. It was envisioned that PCVs assigned to guinea-worm-endemic communities, but with primary assignments in health, development, education, or agriculture, would still have roles in national guinea worm eradication programs. Since that time, national eradication programs have made great strides, and PCVs are now being assigned specifically to work with district-level guinea worm activities. Hence this guide provides a foundation for the "full-time" guinea worm volunteer as well as useful skills for other PCVs who make guinea worm control a part of their broader assignment.

In reading through the guide, one will see that its content and skills are appropriate for any health and development worker in a guinea-worm-endemic area. Therefore, trainers in national, regional, and local guinea worm eradication efforts are invited to use the guide to train their own district-level staff. In fact, when the guide is used as an in-service training program for PCVs, it is hoped that they will share it with their local counterparts so that all will learn and plan together.

In general, the workshop outlined herein is designed for approximately 20 participants. This number will ensure that there is maximal opportunity for participation and interaction among all trainees.

The Trainers

This training guide has been designed for use by trainers who have dual experience in running workshops that use adult-learning methods and in guinea worm control/water and sanitation projects. The "participatory small group task" design of this workshop will require two to four trainers, depending on the number of participants.

Trainers should be familiar with the country in which the training will take place. A working knowledge of local culture and social structure will be most valuable for sessions on community assessment, disease surveillance, and local planning.

Should the trainers decide to undertake any field activities during the workshop, they will need to recruit local health or community workers who can serve as key informants, guides, and interpreters.

Specific resource people are required to attend Session 3 on agency roles in guinea worm eradication. Proper invitations and reminders are needed to ensure that these people attend.

Organization of the Training Guide

The workshop is divided into 10 training sessions focusing on specific knowledge and skill areas. Depending on the nature of the topic and the assumed degree of the trainees' previous exposure to the issue, the sessions vary in length from two hours to a full day.

Trainers should be aware when using the guide for in-service training that PCVs may have had a one-day orientation session on guinea worm disease during their preservice training. This will influence the length of time and level of detail needed in Session 2 on cause and prevention. On the other hand, when this guide is used as part of preservice training, trainers should note that Peace Corps trainees (PCTs) may never have seen a case of the disease and that, therefore, the content of Session 2 may need to be supplemented with films, slide presentations, and field visits.

Unless a session runs longer than four hours, lunch breaks are not noted; i.e., trainers should schedule a lunch break between two three- to four-hour sessions in a day. Trainers should also schedule brief breaks within sessions as the need arises.

Each session is presented under four main headings:

- **Objectives**—In addition to broad workshop goals, each session has specific training or instructional objectives.
- **Overview**—A brief introductory statement explains what is contained in the session and can be used to help introduce the session to participants.
- **Procedures**—Detailed instructions for conducting the training activities are provided, including time, materials, and training methods.
- **Materials**—A summary list of all handouts and flipcharts to be prepared in advance is located at the end of each session description, along with other materials that might be needed for demonstrations or other activities.

When appropriate, trainer notes are also included at the end of a session to emphasize special preparation and procedures.

All trainers should thoroughly familiarize themselves with each session before beginning the training. Division of responsibilities for sessions and sections should be planned in advance. Some activities and materials will take much advance preparation. Neat, easily readable flipcharts must be prepared carefully. Model demonstrations must be practiced.

Materials for Participants

Each session comes with a set of participant handouts. A full list of these is provided at the end of this introductory section. The handout materials are inserted in the guide in the appropriate session as well as in a pocket at the end of the guide to allow easy removal for photocopying.

The two background documents should be given to trainees at registration. Participants should be told to read them and bring them to each session as reference materials.

To avoid confusion, distribute each handout only at the appropriate time, as noted in each session guide.

Ideally, each trainee should be given a folder in which to keep all handouts. It is common that handouts on one topic will be needed for several subsequent sessions. Therefore, trainees should be told to bring their handout folders to each session.

Note that Handout 2.7 consists of reference articles about guinea worm. You may decide to produce one set for each trainee or simply make a few copies available for trainees to borrow during the workshop, depending on budgetary considerations.

Note, too, that Handout 3.1 must be prepared by the local training team using materials obtained from the national guinea worm eradication program. Also, samples of local and national health education materials on guinea worm should be assembled for display and later use in the workshop.

Adequate supplies of flipchart paper and markers are required for every small group exercise.

Also, note that the following companion publication will be of value to the trainees during the workshop and as a reference to take home: *Community Based Initiatives to Eradicate Guinea Worm: A Manual for Peace Corps Volunteers*, by E. Silverfine, W.R. Brieger, and A. Churchill, 1991. Prepared for the Peace Corps by the Vector Biology and Control Project, USAID.

Workshop Methodology

The design of this training is based on two key assumptions.

1. Adults learn best when they are actively involved in the learning process—doing things, discussing, analyzing, experimenting—rather than passively listening or observing.

2. Participants should learn from each other as well as from trainers and special resource people.

To address the first assumption, the guide has been designed using a variety of learning activities, including the following:

- brief presentations
- large group discussions
- brainstorming sessions
- case studies
- small group tasks
- individual tasks
- practical exercises

Initially, a skill inventory is administered to participants so that trainers will have an idea of what experience trainees bring to the workshop. It is incumbent on the trainers to make use of this information to encourage participants with particular knowledge and skills to share them during small and large group sessions.

Training Site Logistics

The choice of workshop location will depend in part on whether the trainers wish to schedule an optional field exercise for practicing household guinea worm case searches and observation of water sources. In this case the workshop site must be very close to a community where guinea worm is endemic.

At the same time, the workshop site should be accessible to resource people from government and voluntary agencies who will be invited to talk at some sessions.

Generally, one large meeting room is needed, with smaller rooms or spaces nearby for small group activity.

The materials used during the training—flipcharts or, alternatively, chalkboards—are simple and do not require special facilities.

Access to a secretarial service would be useful during the workshop so that flipcharts and ideas generated during group sessions and group reports could be typed and duplicated.

Of course, trainers must guarantee reasonably comfortable accommodations and reliable eating arrangements for participants.

Trainer Orientation

The core training team should be identified well in advance and come together for planning and self-orientation. Issues about team leadership and member roles should be clarified from the beginning.

All team members should read each section of the training guide. Decisions about primary responsibility for preparing and delivering each session should be made, but each trainer must be on hand to help with all sessions.

The core team must plan proper orientation for various local and national resource people who will participate in the training.

Optional Field Work

The workshop design uses a case study approach based on a real village situation in West Africa. In the short time available, this should suffice for providing trainees with a realistic learning experience. Still, it may be desirable to give trainees a chance to get out in the field to practice some of the skills being developed.

Field work would be a potentially valuable complement to two sessions—surveillance (Session 5) and health education practice (Session 7). Both present the practical problem of language barriers. In order to conduct community surveys or deliver health education talks, participants must be able to communicate directly with a target audience. Both sessions also present time constraints. If practice sessions are added, it may be necessary for trainers to modify the schedule by adding an extra day.

Details about preparing the field work, an exercise that may take weeks, are outlined at the end of Session 5. Read them carefully. Note the likely requirement for recruiting interpreters and guides. Note also the need for additional time for analyzing the results of any community survey and additional group time to present these findings.

It may be possible to conduct household surveys and observation of local water sources within the time frame of a five-day workshop. Visits to homes on the evening of day 3 and trips to ponds in the very early morning of day 4 would serve the purpose (unless participants are already too tired). Presentation of survey and observational findings could be made during a special evening session on day 4.

Participants would no doubt find this experience rewarding, but they will benefit only if thorough preparation of the field site is done beforehand, as described in Session 5.

No mention of organizing a field practice for health education with community groups is made in Session 7. Unless participants are fluent in the local language (not French or English), they will be unable to have a useful interchange with community members. The use of interpreters for this exercise would be detrimental to learning. A possibility may be the development of health education talks for local high school students, who might understand spoken French or English. Since no specific time has been suggested for additional health education practice in the community, trainers would definitely have to extend the workshop into a sixth day to accommodate this exercise.

Flexibility

Finally, the key word for any training team using this guide is flexibility. Trainers should feel free to modify timing, methods, and materials as the workshop progresses in order to address the realities of available time, trainee interests, and local logistics. In particular, trainers should be sensitive to any unique aspects of the national eradication program and incorporate these into the training design, since each country is at a different stage in the eradication effort. In sum, the mark of a good trainer is the ability to adapt as the situation evolves.

Session 1

INTRODUCTION TO THE WORKSHOP *1 hour, 55 minutes*

Objectives

By the end of this session, participants will have

- become acquainted with one another and the trainers,
- learned the workshop goals and objectives,
- clarified their own expectations of the workshop,
- inventoried the skills and resources they bring to the workshop, and
- shared their own experience and skills related to guinea worm control.

Overview

Session 1 serves as an orientation to the week's activities and helps establish the learning climate for the workshop. After participants and trainers introduce themselves, the participants work individually to generate their own expectations of the workshop, which are then compared with the workshop goals. A review of the methodology reinforces the participatory nature of the workshop. The participants are then asked to develop norms that will guide how the learning team will work together for the week. The session ends with the participants completing a skills inventory and indicating in which subject areas they feel they bring special skills and knowledge to the workshop.

Procedures

1. Welcome and Introductions ***35 minutes***

Display session objectives on **Flipchart 1.1** and briefly review.

Trainers should introduce themselves and welcome the participants. Any official representatives of agencies or other guests should also be introduced. Opening remarks can be made at this time.

Participants should introduce themselves, giving the following information:

- name
- community where they work
- major duties/brief job description
- brief background (hometown, university, etc.)

Introductions may be modified according to whether participants and trainers have met each other in previous training or orientation exercises.

Also, if non-Peace Corps participants are present (e.g., counterparts, community members, local health staff), they should be introduced by a volunteer who works in their community.

Orient participants to the layout of the training facilities—meeting rooms, toilets, eating areas, and so on.

2. Expectations *20 minutes*

Start the process by posting the following question on **Flipchart 1.2** and give participants a few minutes to think: What are the two most important aspects of guinea worm control that I hope to learn from this workshop?

Ask for and record participants' responses on the flipchart. If more than one person mentions an idea, check it (√) each time. Make sure that each person states two ideas, even if they duplicate what has already been written. At the end, ask if any ideas need clarification (but do not debate the ideas at this time).

3. Workshop Goals *15 minutes*

Refer participants to **Handout 1.1** on workshop goals. Also, write the goals on **Flipchart 1.3** and display it next to the list of expectations.

Indicate that the amount of time in this workshop devoted to cause and transmission of guinea worm disease will depend on participants' previous exposure to any orientation sessions on the disease and any possible field experience they may have. Generally, this workshop will concentrate on specific actions needed to organize community-level eradication efforts.

Give recognition to the fact that some participants may have a variety of primary duties (teaching, health, community development, agriculture extension, etc.) other than guinea worm eradication. Therefore, the trainers should not expect that all participants will become specialists in guinea worm control and devote all their time to it after the workshop. In fact, the workshop will examine how and which guinea worm control efforts can fit into the normal workload of each participant.

Now, compare the list of participants' expectations with the workshop goals. Note where these overlap. Clarify goals at this point.

If several people have mentioned an additional topic, negotiate how this might be covered during the next five days. Explain that the trainers will be available to discuss any other individual interests not covered in the main workshop objectives.

Participants will be more likely to accept that all their expectations cannot be met if the trainers are open about workshop limitations in the beginning and show some flexibility.

4. Workshop Schedule and Methods — *10 minutes*

Refer participants to **Handout 1.2**, the workshop schedule. Also post **Flipchart 1.4** with the schedule and display it in the room throughout the course.

Review the schedule and indicate how each session will meet certain workshop goals.

Explain that active or participatory methods will be used throughout. Reality will be interjected five ways:

1. Participants will share their own experiences from the communities where they work.
2. Representatives from agencies actually working on the guinea worm eradication program will talk to the group.
3. A case study based on a guinea worm control project in Nigeria will be the basis for some exercises.
4. Field work will be planned by trainers where feasible.
5. Participants will make plans they can actually implement when they return to their communities.

5. Norms — *15 minutes*

Explain that since everyone must work together for five busy days, a set of norms will help guarantee smooth running of the program. Note that one of the most important norms of this workshop is that participants will help train each other by drawing on their valuable backgrounds. This and other norms listed below should be posted on **Flipchart 1.5**.

- Participants will share their knowledge, experience, and skills with one another.
- Attendance is expected at all sessions.
- All sessions will start on time. Both trainees and trainers will observe the schedule.
- Active participation is expected at all sessions.

- People should feel free to ask questions and make comments at any time.
- If non-Peace Corps participants are in the group, Peace Corps volunteers will make every effort to include them in all learning and social activities.
- Trainers will make themselves available to discuss individual participants' learning needs privately.
- Others—as appropriate.

Ask participants if they wish to offer other norms for the group. They may mention expectations that they have of the trainers also. Add any others on which there is consensus.

6. Skill Inventory ***10 minutes***

Distribute **Handout 1.3**, and ask each participant to check the appropriate items quickly.

While participants are completing the form, post a sample of the inventory form, **Flipchart 1.6**. Collect the forms when participants have finished.

Now ask participants the following question: "Based on the form you have just completed, what are two of the most important areas of knowledge and skill you bring to this workshop?" Write the name of the participant(s) next to the items mentioned. This resource sheet may be copied and circulated, or if secretarial facilities are unavailable, it may be left posted for future reference.

7. Wrap-up ***10 minutes***

Briefly summarize the first session's activities, particularly objectives and norms. Refer to the posted objectives for the session and ask participants if these have been met.

Make sure all participants have a copy of these documents:

- The Apata Village Case Study
- "Guinea Worm Disease" reference document by D. Hopkins

Announce a short break before the next session. Remind participants to review the two background documents during the break if they have not done so already.

At this time participants who may have come late should register.

Trainer Notes

- Be sure to give the background documents to the trainees during registration if possible, but no later than the end of the first session. These should be studied prior to the second session.
- Note that the workshop design can serve different groups, for example, trainees at preservice who will work on guinea worm as a primary assignment, or volunteers during in-service who live in areas where guinea worm is endemic, but who have other primary assignments. Indicate to trainees during the talk about expectations how the workshop will be adapted to their particular needs.

Materials

Handouts

1.1 Workshop Goals

1.2 Workshop Schedule

1.3 Guinea Worm Control Skills Inventory

Background Documents

1. "Guinea Worm Disease," by Donald Hopkins
2. Helping Communities To Eradicate Guinea Worm: A Case Study of Apata Village

Prepared Flipcharts

1.1 Session Objectives

1.2 Learning Question/Important Aspects of Guinea Worm Control

1.3 Workshop Goals

1.4 Workshop Schedule

1.5 Workshop Norms

1.6 Skills Inventory/Resource List

WORKSHOP GOALS

With the knowledge and skills imparted at this workshop, participants will

1. Explain the symptoms, cause, preventive measures, disability, and treatment associated with guinea worm disease.
2. Describe the global and national guinea worm eradication programs and the roles of Peace Corps volunteers (PVCs) in this effort.
3. Define the process of and topics for community assessment as a basis for starting a guinea worm control program.
4. Differentiate the types of community surveillance procedures and analyze results of surveillance studies.
5. Design a plan for community surveillance and data gathering including household survey, observation of water sources, review of local records, and focus group discussion on local beliefs.
6. List, design, and deliver appropriate health education techniques to teach individuals and groups about guinea worm prevention.
7. Outline the steps involved in organizing community health education and mobilization for guinea worm control.
8. Develop a local action plan that incorporates the issues covered in this workshop and that can be applied by the PCV in the field.
9. Identify and propose solutions for common program management problems.

WORKSHOP SCHEDULE

The following is a general outline that may be modified according to local needs. Trainers will post a more detailed schedule at the beginning of the workshop.

Day 1

Session 1: Introduction to the Workshop

Session 2: Review of Cause and Control of Guinea Worm

Day 2

Session 3: National Guinea Worm Eradication Programs and Roles for Peace Corps Volunteers

Session 4: Community Assessment

Day 3

Session 5: Surveillance: Definitions and Procedures

Day 4

Session 6: Health Education with Individuals and Groups

Session 7: Hygiene Education Planning and Practice

Day 5

Session 8: Community Education and Action

Session 9: Planning and Managing Local Action

Session 10: Wrap-up and Evaluation

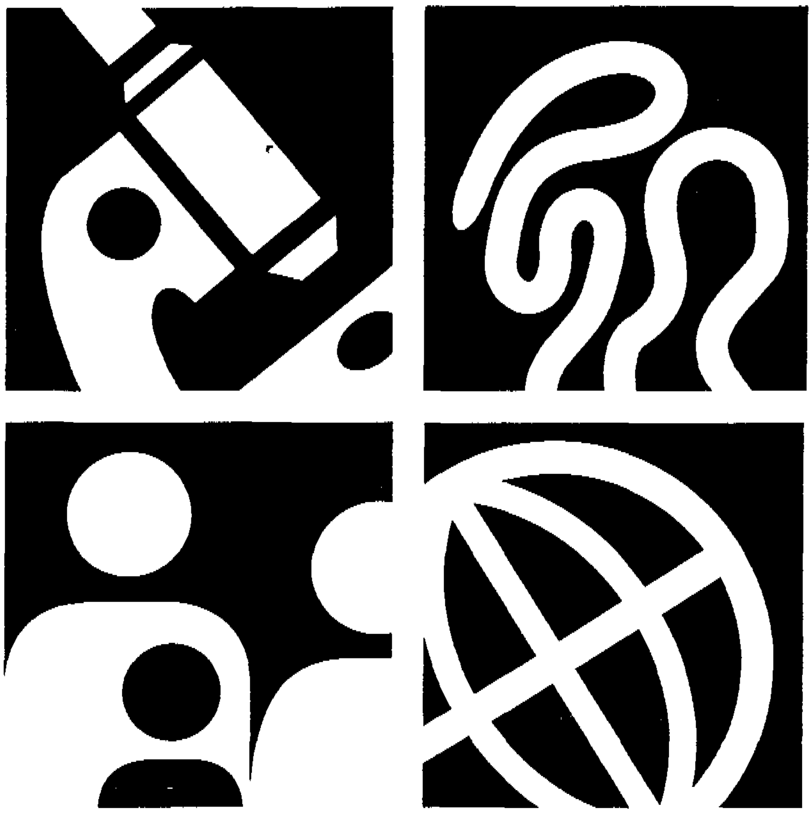
GUINEA WORM CONTROL SKILLS INVENTORY

Please mark the boxes below indicating areas of experience and skill that you bring to the guinea worm control effort. During this session we will be sharing information about our background and skills. In this way we can learn from each other as the workshop progresses.

NAME: ____________________

	Skill Level		
	High	Moderate	Low
1. Organizing Meetings	☐	☐	☐
2. Delivering Talks	☐	☐	☐
3. Conducting Surveys	☐	☐	☐
4. Writing Program Plans	☐	☐	☐
5. Leading Group Discussion	☐	☐	☐
6. Local Fund-raising	☐	☐	☐
7. Analyzing Study Results	☐	☐	☐
8. Mobilizing Local Groups	☐	☐	☐
9. Telling Educational Stories	☐	☐	☐
10. Demonstrating New Techniques	☐	☐	☐

GUINEA WORM DISEASE



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Life cycle illustrations: Taina Litwak
Cover design: Anne Masters Design, Inc.

The blue square shows a Guinea worm. The other symbols depict essential components of vector-borne disease control: the environment, communities and research.

GUINEA WORM DISEASE

(Dracunculiasis)

by

Donald Hopkins, M.D., MPH

August 1990

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Executive Summary

Guinea worm disease, or dracunculiasis, affects about 10 million people in 19 African and Asian countries. It is a devastating, crippling disease that occurs most often in poor agricultural communities in rural or peri-urban areas. There have been few attempts to quantify the effect of Guinea worm disease on economic productivity. However, more than 120 million people are believed to be at risk of infection, which results in periods of incapacitation that may exceed two months. Since these periods often coincide with peak agricultural labor needs, the economic impact is significant.

Humans are the only definitive host for the infection, which concludes with the emergence of a female worm through a blister on the trunk or lower limbs of the victim. When the infected person tries to relieve the burning pain of the lesion by bathing the affected area, millions of larvae are exuded into the water and infect copepods (water fleas). If this water is also the community's source of drinking water, the copepods infect other people. There are no drugs to treat the disease, secondary infections are common and the development of the worm, which may reach three feet in length, takes almost a year.

Despite the gloomy picture presented by the infection process, Guinea worm disease is rarely fatal. Measures to prevent it are community-based, inexpensive and extremely effective. In fact, considerable momentum is growing to globally eradicate the disease within the next decade.

The mechanisms that will be used to achieve control include health education, protection of drinking water sources and filtering copepods out of the water or destroying them with heat or chemicals. Current research efforts focus on improving the impact of these mechanisms in community settings. There is no tropical parasitic disease that has more potential for control or eradication than Guinea worm disease.

2

1.0 Introduction

Guinea worm disease, or dracunculiasis, is a parasitic disease caused by females of the nematode species *Dracunculus medinensis*. The disease is transmitted to humans when they drink water that contains infected copepods (water fleas), which act as the intermediate hosts for the nematode.

a. Biogeography

Dracunculiasis represents a serious health risk in arid and semi-arid parts of Africa, India and Pakistan (Map 1). The disease is found most often in poor, rural African communities, where prevalence rates of more than 40 percent are common. In India and Pakistan, where various surveillance and control measures are employed, prevalence rates of less than 20 percent are reported. The disease also is reported in Yemen and Saudi Arabia, but the epidemiological data from these areas are insufficient to provide an accurate picture of its prevalence.

b. Parasitic agent

The parasitic nematode *Dracunculus medinensis* causes dracunculiasis in humans. People become infected when they drink water contaminated with infected copepods (water fleas), which are usually found in wells, ponds and other stagnant bodies of water. Infective larvae of the parasite contained within the copepod are released into the human intestine. They migrate to deep subcutaneous tissues, where they mate. The male worms are tiny and play no direct role in disease pathology.

No symptoms occur during a one-year incubation period. Once it has attained maturity, the now lengthy (one-meter-long), mature female worm migrates to a position under the skin, most often in the leg, where she elicits a painful blister. Eventually, the blister bursts, exposing the head of the worm. When the limb is immersed in water, the worm releases thousands of first-stage larvae. If the worm is not extracted, it will continue to expel larvae for some time whenever the affected part of the body comes in contact with water. These larvae may be ingested by copepods and mature to the infectious stage, usually in two to three weeks. They can continue the cycle by infecting the next person who ingests them in drinking water.

There is no animal reservoir of *D. medinensis*. Although related species of *Dracunculus* affect various wild carnivores in some areas, those parasites do not infect humans.

Guinea worm disease is symptomatic only when the female worm emerges through the skin, producing intense burning and irritation. People often immerse the affected limb in water in an effort to reduce the pain and irritation, which in turn stimulates the female worm to release larvae, thus completing the life cycle of the Guinea worm (p. 4). The open ulcer and physical extraction of the parasite usually last from one to three months. Pain and secondary bacterial infection often prevent the patient from standing or walking. In some cases, arthritis, deep abscesses and secondary infections are introduced through the open lesion on the skin. Fatalities are rare, but permanent disability occurs in an estimated one percent of cases.

c. Intermediate hosts

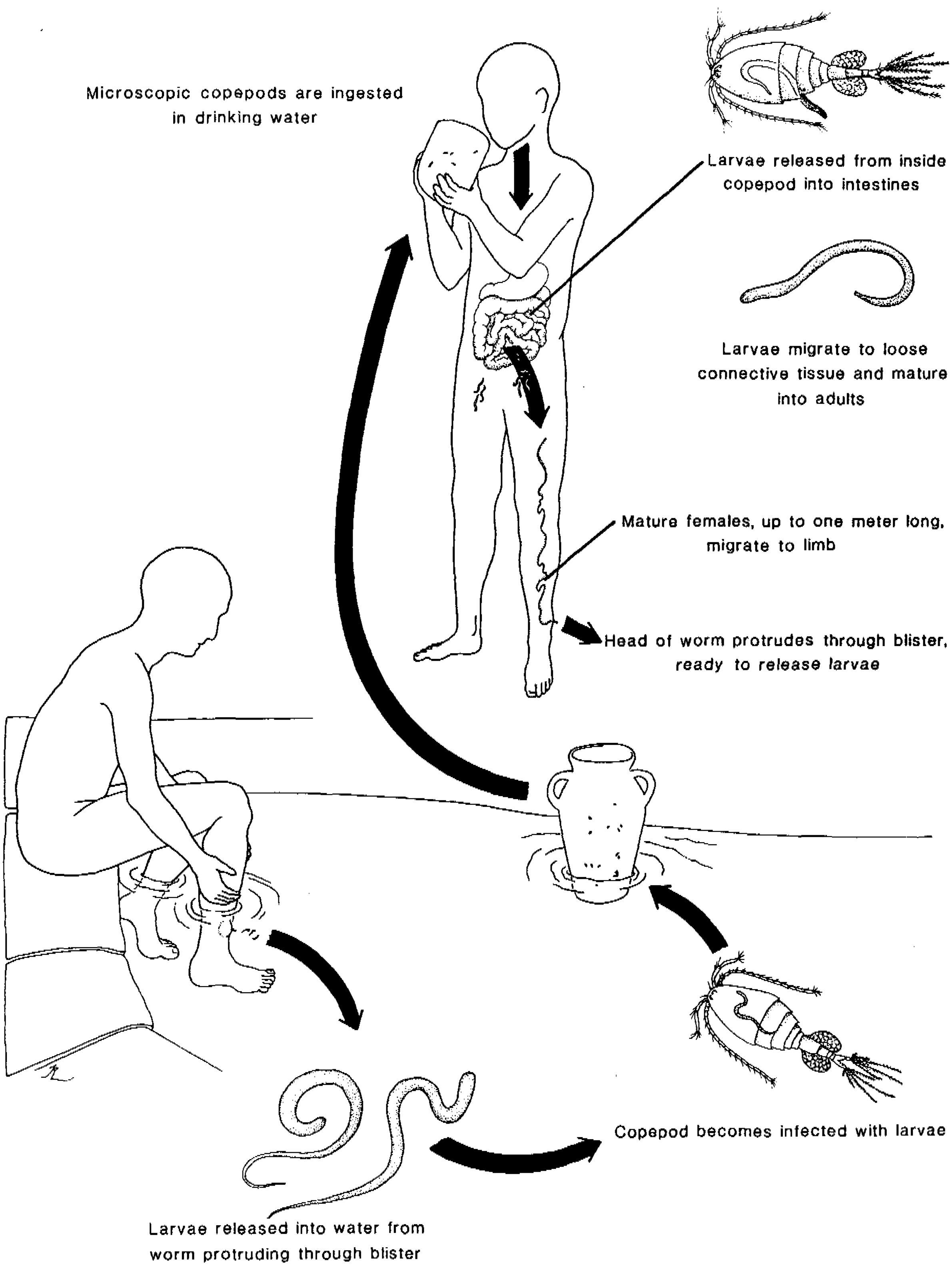
The reproductive biology of the cyclopoid copepods is well-adapted to the temporary ponds that are among their most common habitats. Females may reproduce parthenogenetically for many generations, then produce a generation of both males and females before the aquatic habitats dry up. This sexual generation produces fertilized eggs that are resistant to dessication and can remain viable until subsequent rains reestablish the habitat. Such eggs, which are easily transported from place to place by birds, cattle and other animals or by flooding, establish new populations. These new populations remain free of Guinea worm infection until *D. medinensis* larvae are introduced by man.

Unlike mosquitoes, black flies and other blood-sucking insects, the copepod does not actively transmit the infection. Therefore, it is considered an "intermediate host" rather than a "vector."

The copepods that contain the infective, third-stage larvae (about five copepods out of 100 may be infected) tend to sink to the bottom of ponds and step wells. As a result, individuals are more likely to scoop up infected copepods during the dry season when water levels are low. Seasonality is an important aspect of the epidemiology of the disease. Infected copepods are more likely to transmit the disease to man when rivers, streams and ponds form shallow pools or during the rainy season in arid zones, when cyclops populations are at their highest peak.

4

Life Cycle of Dracunculus medinensis



2.0 Distribution and Severity

Guinea worm disease is believed to afflict an estimated five to 15 million people in Asia and Africa every year. In India, which is one of the only countries in the world conducting active surveillance and employing measures to control dracunculiasis, the disease is reported in six states in the western part of the country, with about half of all the cases occurring in Rajasthan State. The number of endemic villages has declined from 12,840 in 1983 to 5,634 in 1987. An estimate 8.2 million people are at risk of the disease in Pakistan, where the disease is greatly underreported and active surveillance programs had not been conducted until recently. In 1988, a National Guinea Worm Survey detected only 1,111 cases and projected the eradication of dracunculiasis from Pakistan as early as 1990.

One hundred and twenty million people are estimated to be at risk of the disease in 19 African countries: Benin, Burkina Faso, Cameroon, Central African Republic (C.A.R.), Chad, Côte d'Ivoire, Ethiopia, The Gambia, Ghana, Guinea, Kenya, Mali, Mauritania, Niger, Nigeria, Senegal, Sudan, Togo and Uganda.

The most recent information on reported cases of Guinea worm disease submitted to the World Health Organization (WHO) is included in Table 1 in the annex. However, these numbers probably do not provide an accurate picture of the disease's severity because the infection is greatly underreported in Africa. Most infected people live in isolated rural villages and are unable to seek help or medical assistance from clinics or health centers. Active surveillance is not employed consistently.

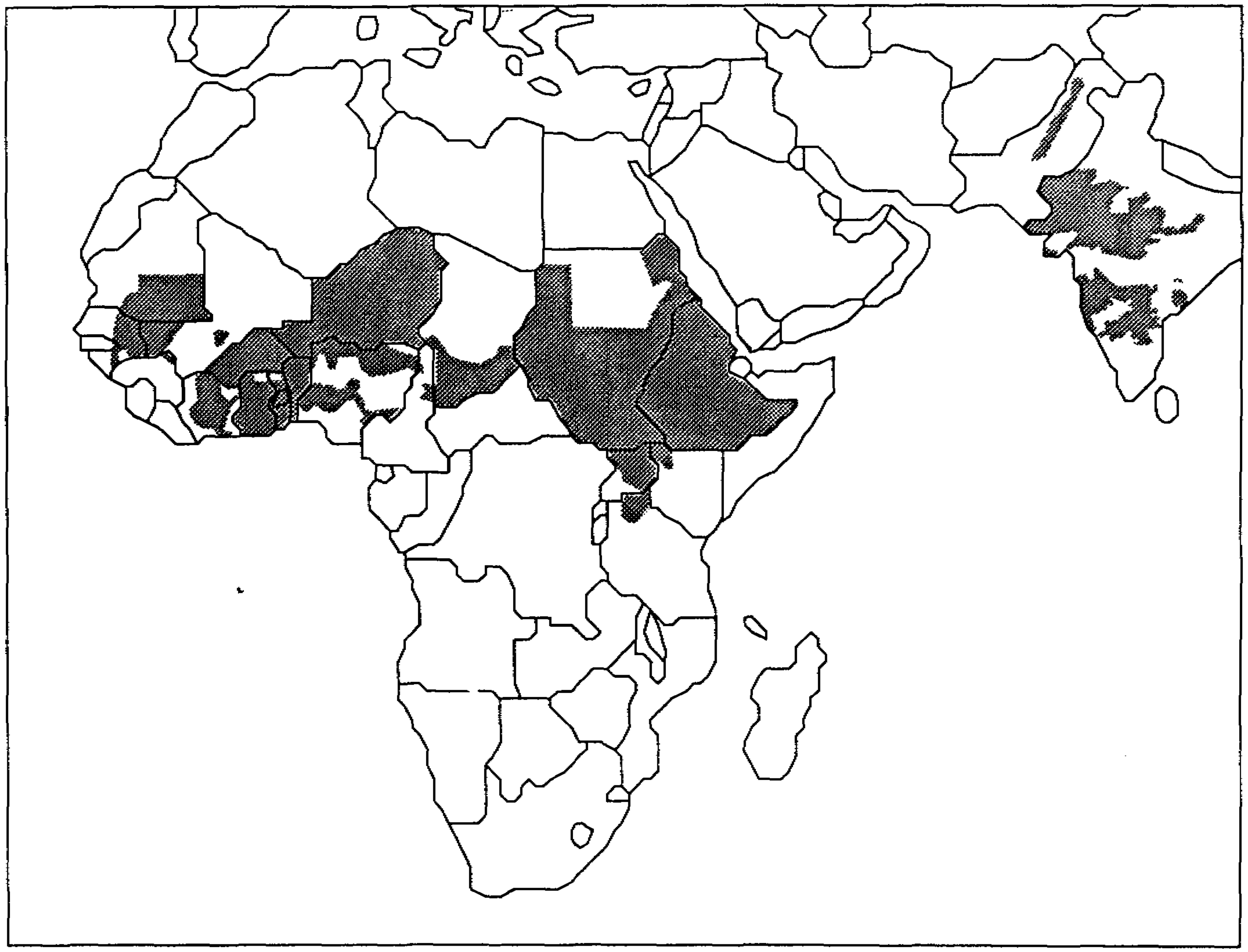
a. Populations affected by dracunculiasis

Dracunculiasis is a disease that affects poor, rural or peri-urban populations that do not have year-round access to safe drinking water supplies.

b. Endemicity

The annual life cycles of the parasite and intermediate hosts foster focal endemicity where poverty and unsafe, open water supplies exist. Movements of people enhance continued introduction of infection into previously clean areas.

Map 1. Distribution of Dracunculiasis



Prepared by the Vector Biology and Control Project
Sources: S. Watts (1987). Am. J. Trop. Med. Hyg. 37(1):119
World Health Organization, 1989

c. Child survival

Although Guinea worm primarily affects adults between the ages of 15 and 44, children are also infected and suffer from temporary disability for weeks or months. Some are permanently disabled or die of tetanus, a complication resulting from secondary infection of the lesion created by the worm. Children also may suffer from indirect adverse effects (Brieger, et. al. 1988, Watts, et. al. 1989). For example, they may experience poor nutrition because infected adult family members are unable to work and provide food for the family. Many children experience a disruption in education while temporarily disabled by the infection or while attending to the needs of affected adults. Reduction in school attendance of up to 25 percent has been reported from communities in Nigeria (Ilegbodu et al. 1986).

d. Economic impact

There have been few attempts to quantify the impact of the infection on economic productivity, but it is thought to be significant because the weeks or months of incapacitation caused by dracunculiasis often occur when the need for agricultural labor is greatest. In 1982, a World Bank economist estimated that global losses in marketable goods as a result of dracunculiasis amounted to between $300 million to $1 billion per year (Golladay 1982). Paul et al. (1986) calculateded that the equivalent of about 5.3 percent of the total agricultural gross domestic product of Burkina Faso was lost because of the effects of Guinea worm disease on local farmers. A UNICEF study in three Nigerian states estimated that eradicating Guinea worm disease in the main rice-growing belt in eastern Nigeria would double agricultural productivity and result in a projected annual increase in rice sale profits of U.S. $20 million (de Rooy 1987).

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3.0 Control Measures

a. Treatment

There are no drugs to clear Guinea worms from infected people. The ancient, traditional treatment of slowly winding the emerging worm around a stick until it is completely extracted is still widely practiced in rural villages. This process may take several weeks to complete because the worm resists extraction. If the worm breaks during the extraction process, a severe tissue reaction occurs.

In recent years, treatment with the modern anthelmintics niridazole, metronidazole and thiabendazole has provided symptomatic relief of pain, itching and inflammation. Aspirin also has been used to help relieve local pain, but no drug has proved suitable for effective mass treatment. Because a lethal secondary infection is a possible complication of the disease, tetanus toxoid should be administered to patients with open lesions.

When the female worm is visible beneath the skin before it emerges, a superficial incision can be made that allows removal of the entire worm. However, this procedure has its risks and cannot be done after the ulcer has formed because the emergence of the worm apparently creates an immunologic reaction and the worm resists removal.

b. Control of the Intermediate host

The organophosphate pesticide temephos (Abate®) kills *Cyclops* and related genera in ponds or step wells used for drinking water. When applied at the recommended concentration of one part per million, this colorless, odorless and essentially tasteless pesticide is safe for human consumption and innocuous to fish and plants. Temephos also has been used to control black fly larvae in the regional campaign against onchocerciasis in West Africa and it is used in potable water for mosquito control in some areas. However, in order to be effective, it must be applied at four- to six-week intervals during the transmission season.

When a group of Indian researchers used temephos in a village of 3,700 persons, a 97 percent reduction in the incidence of dracunculiasis was achieved in one year (Sastry et al. 1978). The manufacturer of temephos, American Cyanamid Company, has donated a quantity of the chemical to the Nigerian State of Anambra's Ministry of Health and to the Government of Cameroon for efforts to reduce Guinea worm disease through *Cyclops* control.

c. Vaccination

There is no vaccine for Guinea worm disease and no research is being conducted to develop one. People do not appear to acquire any natural immunity to the disease and may be repeatedly infected.

d. Environmental sanitation and health education

Prevention is the preferred means of controlling dracunculiasis because the life cycle of the Guinea worm can be attacked at several points. The most suitable long-term preventive measure is the provision of reliable sources of safe drinking water. Initially, providing safe drinking water is relatively expensive, but it is an effective means of control. In addition to reducing the incidence of Guinea worm disease, safe drinking water provides other major benefits, such as a reduction in the time required to gather water and reduced transmission of diarrheal diseases. During the 1930s, piped water was provided to Igbo-ora, a Nigerian town of about 30,000 persons. Within two years, the incidence of dracunculiasis declined from more than 60 percent to 0 (Muller 1971).

Health education is another potentially effective means of control. In villages where transmission occurs, educating villagers who have blisters or emerging worms not to immerse affected limbs in drinking water sources could produce a desirable behavior change that would interrupt the life cycle of the worm. Convincing villagers to boil their drinking water would prevent ingestion of infected copepods, but fuel for boiling water is scarce in some endemic areas.

Infected copepods also may be removed by filtering water through a piece of cloth. Villagers can be taught to use already available cotton cloth for filtering their drinking water, or more efficient and durable filters can be prepared locally, using imported monofilament nylon material at a total cost of $1.50 to $3.00 per filter. An inexpensive, easily cleaned, durable monofilament nylon material suitable for rapidly filtering contaminated water was developed in Burkina Faso (Duke 1984) and is currently being used in a number of community health programs.

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A health education program conducted in Nigeria demonstrated how education could drastically reduce transmission of dracunculiasis in endemic villages (Akpovi et al. 1981). Health education flip charts explaining how dracunculiasis can be controlled are available from World Neighbors USA.

e. Constraints to control

Technical

Three control measures are currently used to prevent Guinea worm disease: (1) health education and personal protection; (2) control of the intermediate host using temephos (Abate); and (3) providing safe drinking water. Because the effects of temephos are short-lived and persuading people to change their behavior can be difficult, the most effective and sustainable measure is the provision of safe drinking water. This intervention is technically difficult and expensive, but it provides many other benefits besides eliminating dracunculiasis.

Paul et al. (1986) developed a hypothetical Guinea worm control intervention model to estimate a benefit-cost ratio for the three control methods. Based on this model, providing a community with a safe, protected water supply yielded a benefit-cost ratio of 2.46 (assuming that 40 percent of the costs were chargeable to Guinea worm control and taking into account only the Guinea worm-related benefits). Using this same model, control with temephos had an estimated benefit-cost ratio of 3.89 and providing health education alone had an estimated ratio of 4.68 (Table 2).

Manpower

Drilling boreholes and applying temephos require equipment and trained manpower. Providing information about Guinea worm to villagers is not particularly expensive, but community volunteers and PVO staff must be trained to conduct effective health education efforts.

Economic

Although the cost of Guinea worm control measures may appear substantial, these costs are small compared to the hidden costs exacted by the disease on affected individuals, families and countries. Reducing economic productivity losses caused by

Guinea worm disease would contribute directly to efforts to improve the economies of sub-Saharan African countries. Guinea worm control or elimination could be accomplished with both health and developmental benefits.

Health education

Health education can play a key role in the control of dracunculiasis. Information about Guinea worm disease could be included as part of other health education or agricultural extension services at marginal additional costs. However, superstitions and local beliefs about the origins and causes of Guinea worm disease are deeply rooted and make behavioral change slow and difficult in some areas.

f. Guinea worm disease eradication

Dracunculiasis was systematically eliminated from southern USSR in the 1930s, from Iran in the 1970s, and from several middle-eastern countries in the wake of improved living conditions. In India, the incidence rate of the disease has decreased significantly since a National Guinea Worm Eradication Program was initiated in 1980. This program provided active surveillance and control of the intermediate host, improved the water supply to affected villages and introduced health education to endemic areas. In Côte d'Ivoire and the Republic of Guinea, dracunculiasis' prevalence rates have been reduced dramatically over the past two decades due to aggressive rural water supply programs.

During the Water and Sanitation Decade (1981-1990), Guinea worm disease has become the focus of increasing attention and efforts have been directed toward eradicating it in some areas. These include:

1981 Identification of dracunculiasis as a priority target during the Decade by the Steering Committee of the Decade.

1982 An International Workshop on Opportunities to Control Dracunculiasis.

1985 Designation of the Centers for Disease Control (CDC) as the World Health Organization (WHO) Collaborating Center for Research, Training and Control of Dracunculiasis in Nigeria.

1986 Adoption of a resolution for Dracunculiasis Elimination by the thirty-ninth World Health Assembly.

1986 First Regional Workshop on Dracunculiasis in Africa.

1986 Agreements reached between the Governments of Pakistan and Ghana and Global 2000, Inc., of the Carter Presidential Center in which the latter agreed to help those two countries develop and implement national eradication campaigns.

1980s Adoption of national plans for elimination or control of Guinea worm disease by Benin, Burkina Faso, Cameroon, Côte d'Ivoire, India, Niger, Nigeria, Pakistan, Togo and Uganda.

1988 Second Regional Workshop on Dracunculiasis in Africa, Accra, Ghana.

1989 Adoption of a resolution by the forty-second World Health Assembly in May setting the goal of worldwide elimination of dracunculiasis as a public health problem during the 1990s.

1989 "Target 1995: Global Eradication of Guinea Worm," an international donors' meeting sponsored by Global 2000 and the Bank of Credit and Commerce International in association with UNDP and UNICEF in Lagos, Nigeria.

1990 Third Regional Workshop on Dracunculiasis in Africa, Yamoussoukro, Côte d'Ivoire.

4.0 Current Research

a. Diagnosis

The first clear symptoms of dracunculiasis are generally local itching, urticaria and burning pain at the site of a small blister. Within a few days after the onset of the first signs and symptoms, the blister becomes an ulcer containing a protruding worm. No other infection is likely to be confused with the picture presented by an adult *D. medinensis* emerging through an ulcer. Therefore, developing improved diagnostic tests for Guinea worm disease is not a high priority, but such tests could help reduce transmission by identifying infected people before they become capable of infecting copepods.

A fluorescent antibody test and, more recently, an enzyme-linked immunoabsorbent assay (ELISA) employing crude, adult *D. medinensis* antigens have been used to detect antibodies during the incubation period before infection becomes manifest in humans (Muller 1971; Kliks and Rao 1984). Aiyedun et al. (1985) evaluated skin test, immunodiffusion and hemagglutination techniques using a phosphate-buffered extract of dried adult *D. medinensis* antigen. These tests were not found to be useful diagnostic indicators of infection.

b. Treatment

The ideal drug to treat Guinea worm disease would be lethal to developing worms and would interrupt the transmission cycle. Because of the geographical isolation of most populations exposed to Guinea worm, a suitable drug must be relatively non-toxic, effective against the immature stages of the parasite and administered orally so that a minimum of medical supervision is necessary. Such a drug also must be effective in a minimum number of doses (preferably a single oral dose) because long-term treatment regimens would be prohibitive.

Scientists at CDC have developed a good animal model using the ferret *Mustela putorius* to evaluate the potential effects of selected drugs in treating prepatent larval stages of the infection.

c. Control of the intermediate host

When protection of drinking water sources is not possible, copepods may be eliminated by chemical treatment. Much of the research on controlling copepods, focusing on the efficacy of temephos and the duration of its effect, was completed during the 1970s. Studies in Nigeria (Muller 1970), Ghana (Lyons 1073) and India (Shastry 1978, Sharma 1981 and Rao 1982) showed that temephos could eliminate *Cyclops* populations for five to six weeks. Lyons and Shastry also found that temephos treatment reduced infection rates among people using the treated water.

Methoprene (Altosid™) is a member of a family of chemicals that is known to induce alterations in the development and growth processes of insects. A synthetic juvenile hormone analog, it has been evaluated extensively against mosquitoes and non-target organisms and is sanctioned by the U.S. Environmental Protection Agency and WHO for use as a mosquito larvicide in drinking water sources. The Centers for Disease Control is evaluating Methoprene to determine the susceptibility of various stages of *Cyclops vernalis*.

d. Health education and community prevention

Health education and community prevention are the most promising areas of current research on Guinea worm disease. Dr. T. R. Guiguemde of the Centre Muraz in Burkina Faso has been evaluating the efficacy of health education, water supply and cyclopod control interventions in several villages with support from his government, the OCCGE, USAID (SHDS) and WHO/AFRO. He also has conducted trials to determine the efficacy of monofilament nylon filters for reducing Guinea worm prevalence.

Studies are being conducted at the University of Ibadan, Nigeria, on the efficacy of various health education interventions, including the adoption and use of monofilament nylon filters and on other behavioral research topics. This research receives support from the UNDP/World Bank/WHO Special Program of Research and Training in Tropical Diseases (TDR).

5.0 Dracunculiasis From the A.I.D. Perspective

Nearly all of the countries in which dracunculiasis occurs receive A.I.D. assistance. Although it has not been ranked as a number one health problem by any of these countries, the disease remains a serious localized threat to human productivity and quality of life. Adoption of a resolution for the elimination of Guinea worm disease by the WHO's 1986 World Health Assembly has focused attention on the problem. The resolution has been a significant factor in encouraging improved country reporting and the development of national plans for control and eradication.

Guinea worm is a disease of abject poverty, so the main appeal for its control is humanitarian. As a rural disease, it lacks the visibility of diseases that affect urban populations and receives less attention from epidemiologists and statisticians. Guinea worm disease was not reportable in most countries until recently. Most experts agree that the disease is an impediment to agricultural production, but there have been few efforts to study its impact with sound multisectoral studies.

The only current bilateral A.I.D. program that supports Guinea worm control is in Ghana, where in August 1989 the USAID Mission made available the equivalent of US $2.3 million in local currency to the Ministry of Health for its Guinea worm eradication program. Through its centrally funded WASH and VBC projects, A.I.D has funded a Guinea Worm Information Network that distributes information to more than 500 participants in developing countries. Another recent development is the initiation of a Guinea Worm Eradication Program through the Peace Corps, which began in 1989.

The most likely entry points for assisting Guinea worm control efforts appear to be under the aegis of the community health and water and sanitation programs that are part of the A.I.D. portfolio. Regular meetings between A.I.D., WHO, Global 2000, UNDP, UNICEF and the Peace Corps have developed into a forum for initiating collaborative opportunities to support more effective control.

Since the 1986 World Health Assembly resolution on Guinea Worm Disease Eradication was adopted, considerable momentum for a global eradication effort has been obtained. As a result, a number of African countries have been encouraged to develop national plans for Guinea worm control with eradication as the eventual goal.

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The Agency's strong commitment to community-based health care and the tenets of Guinea worm disease control are well-matched because there are few diseases so directly linked to the health of the community and its water supply.

a. The Horizon

The perception of dracunculiasis as a globally eradicable disease is bound to be a hotly debated topic during the next decade. Certainly all indicators point to the elimination of the disease from countries that have given it a high priority, including India and Pakistan. Guinea worm is extremely preventable because it has no other host than man, larvae from an infected person must be introduced into the drinking water supply to perpetuate infection, and ingesting infected copepods from contaminated drinking water is the only way to contract the disease.

The mechanisms for achieving control, such as health education, protection of water supplies and elimination of copepods from drinking water, are simple, inexpensive, extremely effective and appropriate for community-based efforts. The development and implementation of existing technology will have the greatest impact.

b. Priorities for future action

- Building advocacy for dracunculiasis control by demonstrating a clear association between the disease and economic productivity. Through this mechanism, the costs of control can be justified at a national level and those costs can be made part of the development budget, rather than an extra burden on health resources. If political advocacy is to be achieved, it will be on economic, not humanitarian, grounds.

- Developing comprehensive plans to control Guinea worm disease in countries where governments have demonstrated a commitment to control by including financial resources in the national budget.

- Including a Guinea worm control component in designs of future projects in all sectors (health, community development, water and sanitation and agriculture) in endemic areas.

- Encouraging the application of dracunculiasis control technology by other agencies, organizations and PVOs.

- Supporting anthropological studies to identify gaps in knowledge and superstitions about transmission of Guinea worm disease among community members in order to design more effective control measures.

- Supporting operational research efforts to identify the most effective mixture of community-based interventions for specific geographical areas. These interventions would include health education, filters, water source protection, chemical control of copepods and supportive treatment through primary health care.

- Identifying and promoting the education of voluntary workers who may play an active role in preventing Guinea worm transmission in communities. Particular attention should be paid to the role of women and to the development of simple, effective visual aids and manuals for control personnel and volunteers to use in health education efforts.

- Developing an effective one-dose oral drug to treat people with patent infections and a simple diagnostic test to identify infected individuals before the worms emerge.

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Annex 1. Tables

Table 1. Reported Cases of Dracunculiasis, 1985–1989*

Country	1985	1986	1987	1988	1989
Benin	—	—	400	33962	5692
Burkina Faso	458	2558	1957	1266	5122
Cameroon	168	86	—	752 +	871 +
Ctr'l. African Republic	31	-	1322	—	—
Chad	9	314	—	—	—
Cote d'Ivoire	1889	1177	1272	1370	1555
Ethiopia	1467	3385	2302	751	—
The Gambia	-	-	-	—	—
Ghana	4501	4717	18398	71767	171572
Guinea	-	-	-	—	-
India	30950 +	23070 +	17031 +	12023 +	7881 +
Kenya	—	—	—	—	5 +
Mali	4072	5640	435	564	483
Mauritania	1291	—	227	608	447
Niger	1373	—	699	—	—
Nigeria	5234	2821	216484	653492	622414 +
Pakistan	—	—	2400	1111 +	535 +
Senegal	62	128	132	138	—
Sudan	—	822	399	542	—
Togo	1456	1325	—	178	2749
Uganda	4070	—	—	—	124

*** From passive reporting and/or area-limited searches unless otherwise indicated**
+ National survey
--- No data available
- Zero cases reported

Source: Centers for Disease Control, Guinea Worm Wrap-up #27.

Table 2

Cost-Benefit of Hypothetical Guinea Worm Control Interventions In a Two Year Program Reaching 50,00 People in 100 Villages

Intervention	Cost-Benefit Ratio, no health care available[1]	Cost-Benefit Ratio, health care available[2]	Cost Per Capita, Guinea worm control[3]
Community Water Supply[4]	2.46	2.61	$8.05
Chemical Control (Abate)[4]	3.89	4.14	$3.95
Health Education/ Community Participation Alone[5]	4.68	5.09	$2.82
Health Care Only		0.74	$27.43

Notes:

[1]Health care includes bandaging of lesions and medical care for expected number of secondary infections resulting from Guinea worm infection.

[2]Health care assumed available for 50 percent of the population.

[3]Net present value of program over 10-year horizon divided by target populations of 50,000. Assumed two years implementation cost and eight years running costs; 7.5 percent discount rate.

[4]Community water supply and chemical control interventions also include epidemiological surveillance and health education/community participation components.

[5]Also includes epidemiological surveillance component.

Source: Dr. John Paul. Calculations based on WASH Technical Report No. 38 (September 1986) "Cost Effective Approaches to the Control of Dracunculiasis."

Annex 2. Additional Resources

Several excellent educational films have been developed, including "The Fiery Serpent" and "The Waters of Ayoli," presenting in simple terms the transmission, impact and prevention of the disease. Health education flip charts explaining how dracunculiasis can be controlled are available in English and French for U.S. $4 each from World Neighbors USA, 5116 North Portland Avenue, Oklahoma City, Oklahoma 73112, USA.

The Guinea Worm Information Network, is a joint activity of two A.I.D.-funded projects, the Vector Biology and Control (VBC) Project and the Water and Sanitation for Health (WASH) Project:

Water and Sanitation for Health Project
1611 North Kent Street, Room 1001
Arlington, VA 22209 USA

Vector Biology and Control Project
1611 North Kent Street, Suite 503
Arlington, VA 22209 USA

Global 2000 Inc.
Carter Presidential Center
1 Copenhill
Atlanta, GA 30307
USA

WHO Collaborating Centre for Research,
Training and Control of Dracunculiasis
Centers for Disease Control
F22
Atlanta, GA 30333
USA

The VBC Project is managed by
Medical Service Corporation International
and its subcontractors

Harvard University
Tulane University
The Henry M. Jackson Foundation

Vector Biology and Control Project
1901 North Fort Meyer Drive
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(703) 527-6500 Telex: 248821 (MSCI UR)
Cable: MSCI Washington, DC

HELPING COMMUNITIES TO ERADICATE GUINEA WORM: A CASE STUDY OF APATA VILLAGE

Apata Village represents the common problems found in guinea-worm-endemic areas of West Africa. While reading the case study, think about how the situation is similar to and different from that in the village where you work. Similarly, solutions you derive for the problems in Apata may or may not be relevant to the village where you are based. Always think carefully about the social, cultural, economic, and political reasons why your ideas for Apata may or may not be adaptable elsewhere. In the process, hopefully, you will come to realize that there is no magic solution that can be applied in every situation. Creative local planning is always needed.

Descriptive information about Apata is provided below, but it is impossible to put everything into a short case study. Therefore you are expected to fill in any details needed to complete exercises and assignments as may be particularly applicable to the communities where you work.

Geography and Population

Apata is a small agricultural village located some 15 km from the district headquarters and about 100 km from the regional capital in a savannah zone of the country. Its 2,500 residents (see Table 1) are involved in one aspect of agriculture or another. Apata is located off the main road that runs through the district. There is one main street running north and south with small paths branching off it.

The main town is divided into three wards (see map). North Ward, with 1,000 residents, is the original settlement. The community itself was founded more than 100 years ago. The name Apata refers to the large granite rocky outcroppings that surround the northern part of town. It is in these rocks that the early settlers found refuge during the intertribal wars of the previous century. These rocks are now sacred, and several shrines to local deities are found in this part of town. Most of the residents in this ward are Muslim or practitioners of traditional religion.

The division between wards is demarcated by a path that branches off the main street and runs directly to the chief's house. On the north side of this path is the Central Mosque and on the south is the main market. In the center of the market is a shrine dedicated to the mother of the first chief of the village, whose spirit guides the welfare of the town.

Just below the main market is South Ward, where another 1,000 people live. This population represents some spillover from North Ward and also some families that migrated to the area from neighboring towns that were not so well protected during olden days. Residents are equally Muslim and Christian. The district authority's dispensary/maternity center is located in South Ward as are the town's two primary-level schools. One school was established in 1950 by Baptist missionaries. The second was set up in 1965 by the district authority.

Most residents of north and south Apata are farmers. Some process the food produced (e.g., make cassava meal from the tubers), others market it, a few are involved in transport, and a number are engaged in support businesses (e.g., blacksmiths, who make hoes). Traders come from the regional and national capitals during market days to buy fresh and processed foodstuffs from Apata. Both men and women are farmers and have their own fields, but women are more actively engaged in processing and marketing foodstuffs. Maize, yams, and cassava are staple crops that are grown not only for family consumption, but as cash crops, since Apata is part of the rural network that feeds the capital. Other cash crops grown in the vicinity include tobacco and citrus fruits.

Along the southwest border of South Ward is the town's main water supply, a marshy area near the Iworo Stream where numerous ponds and water holes have been dug. Iworo dries up between November and April, but the water holes usually manage to supply some quantity of water throughout the year. The water holes provide the ideal breeding site for cyclops species, the vector for guinea worm. Besides these ponds, there is one seasonal spring located in the rocks near North Ward, but generally North Ward lacks water because of the rocky ground. The local district authority dug two wells for the community back in 1958. One near the market was abandoned after a goat fell in. The second near the maternity center is still in use, but lacks a cover and proper drainage. No one takes responsibility for maintaining these wells.

The third ward is New Ward, which is located near the junction of the town's main street and the road that runs through the district. About .5 km separates the two parts of town, a space filled by the playing fields of the primary schools and a cemetery for Christians. Unlike the main town, which consists of tightly clustered groups of houses that are extended family compounds, New Ward comprises individual homes set on separate lots. Most of the houses in New Ward are made from cement block, while those in the rest of the town are mud or cement-plastered mud.

New Ward contains the younger generation of Apata citizens, who are more educated. The town's secondary school is located in New Ward near the main road. Many of the heads of household in New Ward have primary or secondary education. Most are Christian. Some are businesspeople, but about half work as teachers or civil servants in the district headquarters. In fact many residents of New Ward go to the district health center when they have problems, instead of the Apata Dispensary.

Finally, worth mentioning is a cluster of 10 smaller hamlets of about 50 residents each located about 15 km to the east of Apata. People living there are all farmers. They are descendants of Apata and respect the authority of the chief of Apata. If they send their children to school, they send them to live with relatives in Apata, from where they can walk to school. These farmers visit Apata on market days and holidays.

Attitudes toward Guinea Worm

Guinea worm has been endemic in Apata and the surrounding hamlets for as long as the elders can remember. No one knows where it came from, but people hold various beliefs. Some say it is part of a person's body, something like a tendon. Obviously a person would remember swallowing something as big as a guinea worm, they reason, so it must have been in the body from the beginning.

The worm emerges, some believe, when a person's blood is weak or when the dormant worm in one person's body smells an open guinea worm ulcer on another victim. Another group of people blame the condition on a local deity. This deity inflicts rashes, boils, and other skin eruptions on people, especially during the hot, dry season, as retribution for their misdeeds during the year. In either case, no one can offer an idea of how the condition might be prevented.

Residents recognize the onset of guinea worm disease by an initial rash at the site and fever. After a few days, swelling occurs where the worm should emerge. By the end of the week the worm will have broken through, especially if the person has waded into water.

Apata people do not believe that Western medicine can cure the disease, so they apply local concoctions made from oil and herbs to soothe the painful site. Some people say that any swelling or nodule on the body is a guinea worm. Since they believe the worm is part of the body, they feel it does not always have to emerge. Other problems, like body aches and stomach aches, are blamed on guinea worm as well.

Health workers have repeatedly said that guinea worm is caused by drinking untreated pond water. Apata people can repeat this bit of information, but when pressed say they really do not believe the health workers. Look, they say, at our sons and daughters who go to live in the capital and still get guinea worm, or look at the old men who have drunk pond water all their lives and never gotten the disease.

These beliefs do not mean the people of Apata are happy about guinea worm. Those afflicted may be bedridden for weeks and unable to carry out their farm work or trade for months thereafter. During the peak of the guinea worm season (which is also the peak of the dry season), half of the classrooms are empty. There is even a traditional song in Apata entitled "Guinea Worm Don't Knock Me Down This Year."

People complain and hope that government will do something someday about their plight. All that government workers have done recently is bring in a loudspeaker-equipped van that went around the village one day telling people to boil their water. With each pass of the van, village women hurled insults—"Are you going to collect the firewood for us?" "Do you city people with public taps have the time to 'cook' your water before drinking?"

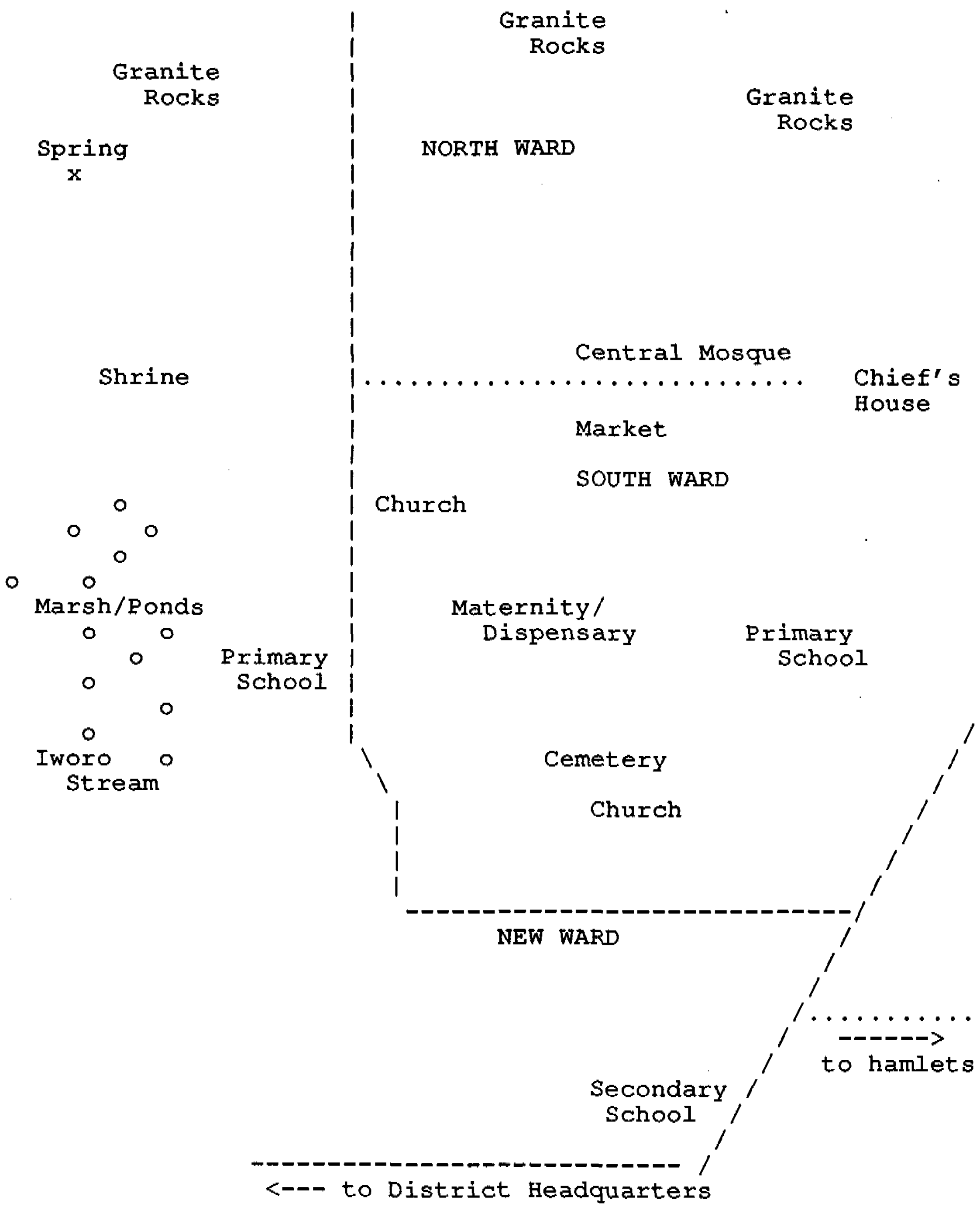
Just this year, a Peace Corps volunteer was posted in Apata to teach in the secondary school. This is the first time a volunteer has come to Apata, and the villagers are quite interested in how this foreigner will help them. They wonder, will this stranger be like the missionaries or like government workers? How can this person help solve village problems like guinea worm?

Table 1

Population of Apata
(1985 Census)

Age (years)	Male	Female	Total
<1	65	60	125
1-4	185	190	375
5-9	125	135	260
10-14	120	130	250
15-19	115	125	240
20-24	65	105	170
25-29	70	110	180
30-34	110	110	220
35-39	110	100	210
40-44	100	80	180
45-49	75	65	140
≥ 50	90	60	150
Total	**1,230**	**1,270**	**2,500**

MAP OF APATA


Granite Rocks
Granite Rocks
Granite Rocks
Spring x
NORTH WARD
Central Mosque
Chief's House
Shrine
Market
SOUTH WARD
Church
Marsh/Ponds
Maternity/ Dispensary
Primary School
Primary School
Iworo Stream
Cemetery
Church
NEW WARD
------> to hamlets
Secondary School
<--- to District Headquarters

Session **2**

REVIEW OF CAUSE AND CONTROL OF GUINEA WORM

4 hours, 45 minutes

Objectives

By the end of this session, participants will have

- identified the symptoms of guinea worm disease,
- described the severity and impact of guinea worm disease,
- enumerated the causes of guinea worm, noting both lay and scientific claims
- listed the different ways of preventing guinea worm,
- distinguished the benefits and limitations of the various guinea worm control strategies,
- explained appropriate circumstances for choosing the various control strategies,
- outlined treatment options for guinea worm victims and the role of treatment in eradication programs, and
- defined what is meant by elimination and eradication of guinea worm.

Overview

The overall objective of Session 2 is to review the cause and control of guinea worm. After a brief introduction, the participants, in a large group discussion, will recall how the disease is recognized. They will draw on photographs, slides/videos, the Hopkins article they received at registration, and their own experiences to produce a list of symptoms. Discussion of the effects of guinea worm disability and of its causes rounds out the large group exercise. Using a case study, the participants will discuss how a fictitious community, whose population suffers from guinea worm, views the cause of the disease.

Following these discussions, the participants will fill out two matrices on guinea worm control options, one for action on existing water sources and one on potential solutions for improved water sources. Then, in small groups, the participants are to decide on control strategies for the case study village. The role of case treatment within the overall control effort will be briefly presented. The session closes by pulling together information about various guinea worm control strategies into a definition of disease eradication.

Procedures

1. Introduction *5 minutes*

Post the session objectives on **Flipchart 2.1** and give a brief overview of the upcoming activities. Explain clearly that this is a review session based on the assumption that most participants have attended the one-day orientation on guinea worm and/or have read the background document by Dr. Donald Hopkins. In addition to reviewing the nature and control of guinea worm, the session will help participants think strategically about its control.

2. Activity: Visualizing the Problem *30 minutes*

This activity is optional depending on whether participants have had a previous orientation session on guinea worm and/or have been working in the field with the disease already. For those with little or no exposure, this period should be used to show the video "The Fiery Serpent" and/or show the TALC slide presentation on guinea worm.

3. Recognition of Guinea Worm *20 minutes*

Begin with the statement, "We cannot hope to solve a problem that we cannot recognize." Distribute the "case recognition photographs" from the Centers for Disease Control, if available. Ask participants to describe the signs and symptoms of guinea worm based on the photos, videos, readings, and personal experience.

Write the descriptions on a flipchart with the heading "SIGNS AND SYMPTOMS OF GUINEA WORM."

When the list is complete, emphasize that the key feature is a worm emerging from an ulcer on the skin. Stress that while a majority of ulcers will be found on the lower limbs (that is, those parts of the body most likely to come in contact with pond water), many ulcers appear on other parts of the body.

Now, ask participants to recall from the case study how people in Apata Village recognize guinea worm. Post these indigenous ideas next to the list of signs and symptoms using **Flipchart 2.2** with the heading "HOW APATA VILLAGERS VIEW GUINEA WORM." Ask participants with field experience to add items to this list based on beliefs in their own villages. These may include

- rash and fever preceding eruption of the worm
- painful swelling prior to emergence

- open ulcer with worm coming out
- any "dormant" swelling on the body
- internal aches and pains

Briefly have the group discuss the implications of diverging perceptions of disease between the two lists (i.e., health workers and community members). In particular, how will this lead to communication problems and program difficulties? Write their observations on flipchart paper. Be sure that they mention the following points:

- Patient reports may differ from health worker definitions, giving rise to different expectations for treatment.
- Health worker communications may not be understood.
- Health worker suggestions may not be accepted.
- Surveillance reports may be inaccurate and subsequently resources may be improperly allocated.

Explain that information such as local beliefs and perceptions is crucial for program planning and that means for gathering such data will be described in upcoming sessions.

Note: A lunch break would be appropriate at this time.

4. Severity and Impact *20 minutes*

Note that "guinea worm does not kill." This being the case, ask the group why so much energy and resources are being devoted to eradicating the disease.

This should lead into a discussion of disability. Distribute **Handout 2.1** and trace with the group the effects of guinea worm disability. Show clearly that while some effects are temporary, others have long-term impact. Also, point out that while this chart refers to the individual sufferer and his or her family, one must consider the impact on the health and economy of a community when many residents suffer from this condition.

Talk specifically about the economic and social effects of the disease on the following groups:

- Farmers
- Mothers
- Young children of affected mothers
- Schoolchildren

5. Cause of Guinea Worm *30 minutes*

Group Discussion

Distribute **Handout 2.2** and ask participants to pinpoint the two human behaviors that aid in the transmission of guinea worm:

- **wading** in water by persons with open guinea worm ulcers
- **drinking** pond water containing infected cyclops

Note that guinea worm is the only water-related disease that is spread entirely by drinking contaminated water.

Next, identify the other conditions that make transmission possible:

- environmental conditions (type of pond)
- seasonal issues (level of pond water)
- biological factors (the vector cyclops)

Encourage participants to make notes on the handout. Point out that if any factor is missing, transmission will not occur. This understanding of the process is essential for developing and selecting appropriate control measures.

Case Study Review

Now refer the group to the case study. Ask what the residents of Apata Village believe causes guinea worm. List these responses on flipchart paper.

Ask participants whether they know what people in communities where they work believe causes this disease. Also record these answers on flipchart paper.

Discuss the implications of divergent notions of causes. Will traditional ideas be easy to change? Can some control strategies still proceed even if people do not change their beliefs?

Cite the example of a community in Nigeria where some people rejected the idea of filters because, like in Apata, they did not believe that anything could prevent guinea worm. On the other hand, these same people were willing to work toward a community well because they valued having access to a reliable water supply instead of trekking a long distance to fetch pond water.

6. Preventing Guinea Worm: Control Options *50 minutes*

Prepare **Flipchart 2.3** using the following matrix and post it:

Action on Existing Water Sources

	Method		
Criteria for Use	**A.**	**B.**	**C.**
Cost			
Long-/Short-term Solution			
Cultural Acceptability			
Simplicity of Use			
Need for Outside Resources/Help			
Maintenance Needs			
Individual or Community Action			

Prepare and post **Flipchart 2.4**, Improved Water Sources, using the same matrix as above.

Group Brainstorming

Lead the group in brainstorming control methods based on existing water sources and write the answers on Flipchart 2.3.

Examples of methods that should be listed on this flipchart include

- filters: cloth, sand
- Abate/Temephos to kill cyclops
- guarding ponds to keep infected people out
- healthy villagers helping infected ones collect water
- erecting barriers to keep people from wading in ponds

Now brainstorm examples of improved sources and write the suggestions on Flipchart 2.4. These should include

- dug wells

- rain catchment reservoirs
- borehole wells
- protected springs
- piped/tap water

Fill in the results of the brainstorming exercise on the two matrices under methods A, B, C, and so on. Ask participants to critique each method listed using the criteria below and enter the consensus concerning each item in the appropriate matrix box.

- Is the cost high, moderate, or low?
- Does the method offer a long- or short-term solution?
- Will the method be culturally acceptable or not?
- Is it simple to acquire/install? What skills are needed?
- Is it technically simple or complex to operate?
- Does it require much or little maintenance? Will parts be available?
- Can it be accomplished with local action, external help, or both?
- Does the method require individual or community action to implement?

Review **Handout 2.3** with the participants as an example of the problems of social and cultural acceptability. Comment that no one control option is perfect. Therefore a balance or mix of strategies will be necessary.

7. Choosing Alternative Strategies — *45 minutes*

Small Group Task

Next, divide the participants into four small groups (one for each section of the Apata community). Post on **Flipchart 2.5** the following group tasks:

- Review the Apata Village case study.
- Note that there are four distinct sections of the community: North Ward, South Ward, New Ward, and the farm hamlets, so each group will be assigned one section.
- Choose a first and second priority guinea worm control strategy for your section.
- Justify your choices/indicate what factors were considered.
- Write answers on flipchart paper.
- Complete work in 20 minutes.

Distribute **Handouts 2.4** and **2.5** to guide deliberations.

Group Presentations

Each group will be given five minutes to present its choices and justifications. After each group has presented, hold a general discussion in which the groups critique each other's plan. Try to come to some consensus about an overall strategy for helping Apata Village.

Make the point, if it has not already arisen in discussion, that even in a small community like Apata, there is not one strategy that fits all situations and sections. In reality there will be a mix of short- (filters) and long-term (wells) approaches.

8. The Role of Case Treatment *20 minutes*

Comment briefly that as noted in the briefing material, there is no "cure" for guinea worm. Various antihelminthic drugs may help marginally to speed up expulsion of the worm and reduce inflammation. Simple aspirin may be just as useful.

Prepare **Flipchart 2.6** with the following treatment options and display it for group discussion.

Treatment Options for Guinea Worm

- pain relievers (e.g., aspirin)
- antihelminthic drugs
  (expensive, some side effects)
- antiseptic lotion to clean site
- winding out the worm on a matchstick
  (carefully so the worm will not break)
- cleaning the dressing of the ulcer
- antibiotics if secondary infection occurs
- immunization to prevent tetanus

Ask the group, "If none of these treatments really cures the disease, why should we bother including treatment in our control programs?" Record responses on flipchart paper. Hopefully, people will mention the following points:

- ethical reasons—to relieve suffering
- practical concerns—people may accept prevention if combined with treatment
- need to prevent long-term disability and death

Demonstration

Show the group how to clean the ulcer to prevent secondary infection. Indicate that ideally an antiseptic lotion like TCP or Detol should be used, but where these are unavailable, a large spoon of salt in a cup of water will also serve the purpose. Assemble the following materials before the group:

- a container of relatively clean water
- cotton wool or small pieces of clean cloth
- bottle of antiseptic lotion
- salt and large spoon with drinking cup
- bowl
- hand soap

Ask for a volunteer to be a patient. Use a marker to draw a guinea worm ulcer on his/her leg. Have the "patient" sit on a chair with his/her leg elevated on a stool or box where all can see. Carry out the demonstration in the following steps:

- wash your hands with soap and water
- put one large cup of clean water in bowl
- add one capful of antiseptic lotion (note that large spoon of salt may be used instead)
- tear off six pieces of cotton wool and drop into the solution
- pick up one piece of cotton, squeeze lightly, and wipe in a downward motion along the left side of the ulcer
- discard the used cotton in a safe place
- repeat with another piece of cotton wiping down on the right side of the ulcer
- repeat on left and right sides with remaining pieces of cotton
- wash hands again with soap and water
- instruct patient to keep the site covered and to repeat the cleaning every morning and evening until the worm is expelled

Explain that treatment of guinea worm ulcers should ideally be incorporated into the existing primary health care or village-based health worker program in a community. In this context, villagers would need to maintain a revolving drug fund to stock a village medical kit that would include such things as cotton wool, disinfectant, and aspirin.

Note that an opportunity to treat actual patients may be possible later if a field trip has been organized as part of this workshop.

9. Understanding Eradication *60 minutes*

Group Discussion

From the audience generate ideas about what is meant by the term eradication. Write these contributions on flipchart paper.

Post the following definition on **Flipchart 2.7**:

"Eradication is the total elimination of a disease worldwide."

Compare participants' ideas with this definition. Emphasize the term "worldwide." This implies that any effort to eradicate guinea worm will not succeed unless every country in which the disease is endemic and the international agencies that serve them work together to solve this problem.

Now focus on the term "elimination." Explain that elimination is a state in which a whole country has been certified as being free of guinea worm for a specified period (in this case approximately three years). Certification is accomplished through the process of surveillance, which will be covered in one of our sessions. In summary, "elimination" from every country equals "eradication" globally.

Note that eradication is planned on a limited or urgent time frame, whereas control is an ongoing process that attempts to keep disease incidence at a minimal level of morbidity and mortality.

Ask participants if they know of any diseases that have actually been eradicated (smallpox)? Can they list other diseases that have been targeted for eradication (malaria, yaws, yellow fever, polio ...), but have either been abandoned (malaria) or are just taking off (polio)? Also record these answers on flipchart paper for all to see.

Small Group Tasks

Divide the participants into three or four small groups. Post the following group tasks on **Flipchart 2.8**:

- select a recorder
- discuss the characteristics of a disease that make it easy or difficult to eradicate

- compare the desirability and feasibility of eradicating guinea worm with that of malaria and polio (use matrix in **Handout 2.6**)
- take no more than 20 minutes for deliberations
- prepare flipcharts for presenting conclusions
- present conclusions to whole group in 10 minutes

Distribute Handout 2.6 on criteria for disease eradication to guide discussion and report preparation. Discussion and reports should focus on which of the three diseases, guinea worm, polio, or malaria, is most feasible to eradicate and why.

The group presentations should be followed by a brief lecture that presents the factors, listed below, that increase the likelihood of successful eradication of guinea worm:

- humans are the only reservoir of infection
- transmission is usually local and seasonal
- effective control technologies, such as improved water supply, are already known
- the disease is easily recognizable, so surveillance and certification of elimination are relatively easy

In contrast, also present some of the factors that may work against eradication:

- populations at risk are hard to reach and scattered
- local beliefs can conflict with preventive messages
- local geology may not favor improved water supplies
- the only available technologies may be unacceptable, expensive, or inconvenient to use
- local health staff may be overburdened with too many responsibilities to face guinea worm eradication squarely

10. Wrap-up ***5 minutes***

Review the objectives of the session and ask about gaps and unresolved issues. Explain to participants that this brief workshop will not make them medical experts for treating guinea worm nor hydrologists and engineers for solving the water supply problem. Their major contribution will be in the areas of program management and health education. This role will be spelled out in more detail in the next session.

Finally, make note of the reference articles that should be made available to participants, as explained below and in **Handout 2.7**.

Trainer Notes

- Case definition photographs should be obtained from the national guinea worm eradication task force, the U.S. Centers for Disease Control, or the World Health Organization, as available in the country.
- For groups that have not had much prior experience with guinea worm, use the film "The Fiery Serpent," which may be available in-country from the representative of Global 2000. It may also be obtained from the Global 2000 office or the International Health Programs Office of CDC, both located in Atlanta.
- Flipchart papers generated through group discussion should be made available to all participants. If secretarial help is available, charts can be typed and copied. If not, leave charts posted long enough for participants to copy them. Be sure to provide notebooks for this purpose.
- Remember to distribute the case study in advance.
- The attached reference articles can be made available to participants in three ways, depending on available resources for copying: (1) make copies for each participant, (2) make one copy of each for each small group, or (3) make several copies available for loan during the workshop.

Materials

Handouts

2.1 Effects of Guinea Worm Disability

2.2 Life Cycle of Guinea Worm Disease

2.3 Issues of Social and Cultural Acceptability of Cloth Filters for Guinea Worm Control in Apata Village

2.4 Methods for Preventing Dracunculiasis

2.5 Guinea Worm Control Strategies

2.6 Criteria for Disease Eradication

2.7 Reference Articles on Guinea Worm

Prepared Flipcharts

2.1 Session Objectives

2.2 Apata Perceptions of Guinea Worm

2.3 Action on Existing Water Sources

2.4 Improved Water Sources

2.5 Group Tasks

2.6 Treatment Options

2.7 Definition of Eradication

2.8 Small Group Tasks to Discuss Eradication Criteria

Audiovisual Aids

- Case definition photographs
- Video—"The Fiery Serpent"
- TALC slide set on guinea worm

Case Treatment Demonstration Materials

References

Brieger, W.R. et al. 1991. Guinea worm control case study: planning a multi-strategy approach. Social Science and Medicine, 32(12): 1,319-1,326.

Brieger, W.R. and J. Guyer. 1990. Farmers' losses due to guinea worm disease: a pilot study. Journal of Tropical Medicine and Hygiene, 93(2): 106-111.

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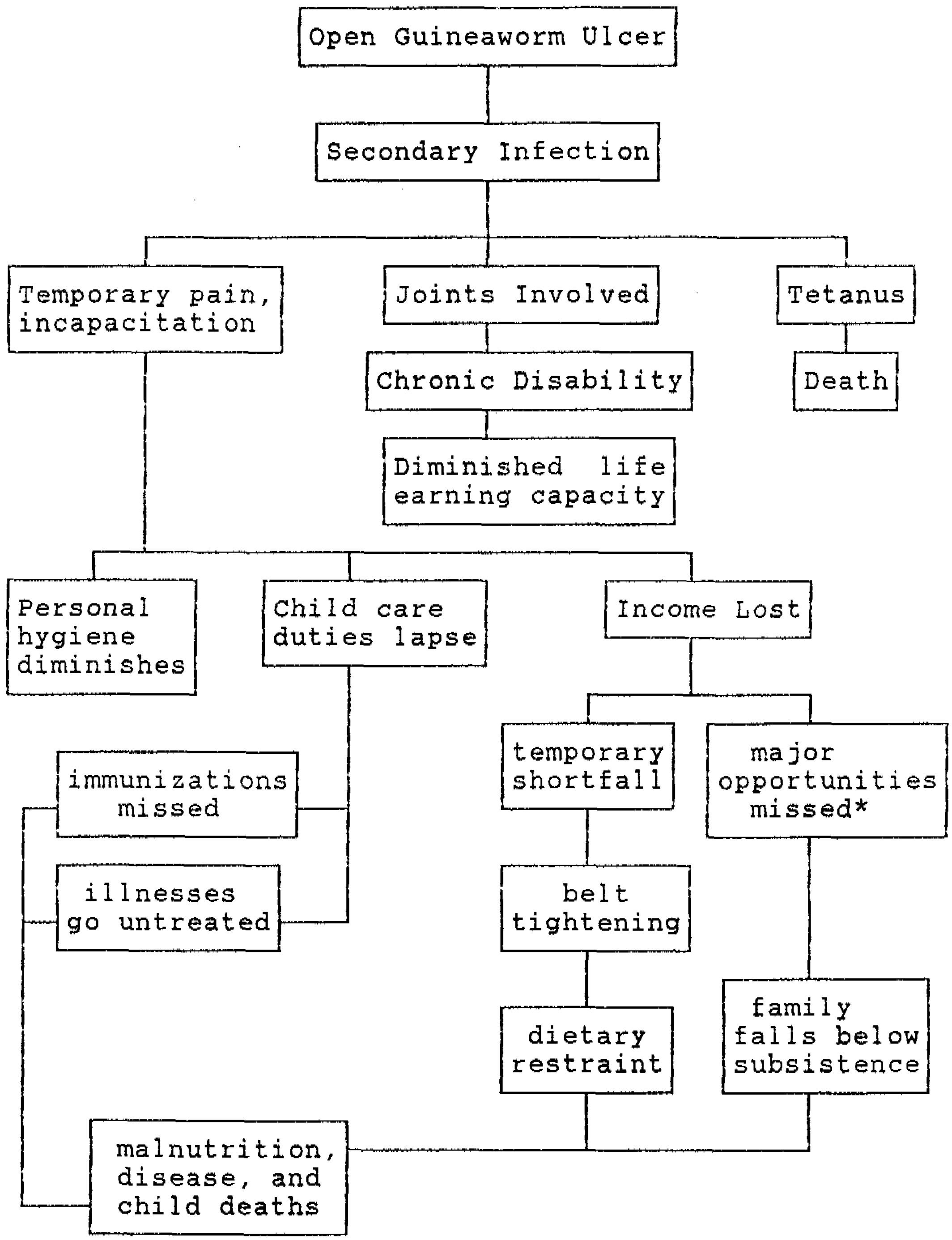
Ilegbodu, V.A. et al. 1986. Impact of guinea worm disease on children in Nigeria. American Journal of Tropical Medicine and Hygiene, 35(5): 962-964.

Ramakrishna, J., W.R. Brieger, J.D. Adeniyi, and O.O. Kale. 1985-86. Illness behavior in guinea worm disease. International Quarterly of Community Health Education, 6(2): 101-114.

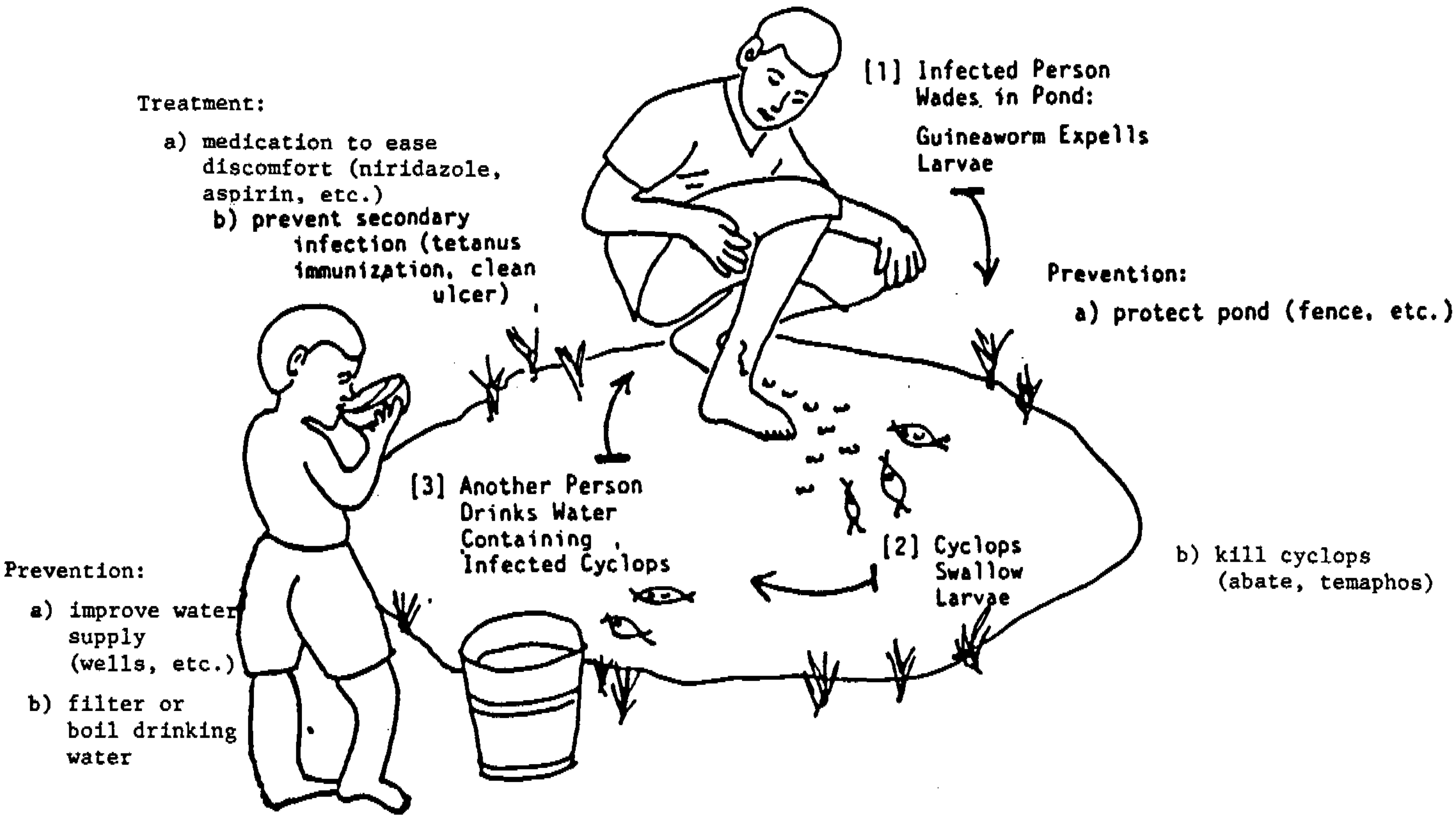
Richards, F. and D. Hopkins. 1989. Surveillance: the foundation for control and elimination of dracunculiasis in Africa. International Journal of Epidemiology, 18(4): 934-943.

EFFECTS OF GUINEA WORM DISABILITY



* having cash to rent a tractor, buy seed,pay child's school fees, contribute to savings cooperative.

LIFE CYCLE OF GUINEA WORM DISEASE



ISSUES OF SOCIAL AND CULTURAL ACCEPTABILITY OF CLOTH FILTERS FOR GUINEA WORM CONTROL IN APATA VILLAGE

The Apata case study was developed from real experiences in Nigerian villages. Efforts in these villages to promote the use of monofilament nylon cloth water filters to prevent guinea worm were generally successful, but uncovered some important positive and negative factors that influenced social and cultural acceptance, as listed below. These show that concern should focus not only on whether people accept or reject a new health technology, but also on the reasons why. Their perceptions may even lead them to accept preventive measures for the wrong reasons, laying the ground for disappointment or failure later.

<u>BELIEFS</u>: Some people believed guinea worm is a natural part of the body, like a tendon, and thus cannot be prevented. Therefore they did not believe the filter would work as promised.

<u>VALUE</u>: Among those who believed in the efficacy of the filters, some considered them to be second rate compared with wells, the more permanent and valued solution.

<u>HABITS</u>: Use of the filter required developing a new, habitual behavior. It is often easy to forget or not want to be bothered. Some would carry the filter with them when they went from a farm hamlet into town, and then would forget it when returning to the hamlet. Even when people remembered to use the filter, they sometimes forgot how to use it correctly and placed it on the pot upside down.

<u>COSTS</u>: Although the filter was sold basically at cost, and this price was less than a measure of rice or about the same as a bottle of beer, some people still complained that they did not have money to buy one.

<u>COMPETITION</u>: We often forget that when we promote or "market" a new health idea it competes with other products. That is, people have choices. In this case people traditionally used alum to settle particulate matter in water. All that would be needed was a few cents of alum to do the job. Unfortunately, alum, while making water appear clear, has no effect on disease organisms. In the long run, use of alum may cost more than a filter, but the short-term costs were much less and the "visible" results were the same.

RESULTS: There were those people who were happy with the filter because they could see what they felt were the "results" of filtering: dirt, leaves, and so on, left behind after pouring water through.

CONVENIENCE: Among users, many people thought the filter was easy to use because a rubber band sewn in the hem made it cling to the pot while they poured water. The monofilament mesh allowed water to flow smoothly, which many appreciated.

SAFETY: Some people had access to well water but still bought filters. They knew that the wells sometimes go dry and so wanted backup protection against guinea worm. They had accepted "modern" health ideas.

OTHER USES: A few individuals liked the filters because they could envision other, though inappropriate uses for them, such as sieving corn and cassava starch.

DAMAGE: Some people blindly accepted their filters and used them regularly to the point where tiny holes started to form. They did not understand that it was not the act of filtering that was protective, but the quality of the cloth. Unfortunately, they did not perceive that the holes were dangerous.

DISTRIBUTION: Generally the filters were distributed through the network of village health workers [VHWs], who were local people selected by members of their hamlets for this volunteer job. As friends and neighbors, the VHWs found it easy to communicate to others in their hamlet and encourage acceptance. In hamlets where there were no VHWs, acceptance was quite low.

An important lesson learned about filters that applies to any health innovation is that no one product will be acceptable to everyone. Alternatives are always needed to formulate a multistrategy approach.

References

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METHODS FOR PREVENTING DRACUNCULIASIS

Method	Advantages	Disadvantages
Deter infected people from entering drinking water sources	■ low cost ■ minimal need for outside support	Depends on— ■ quality of health education ■ degree of social support ■ long-term behavior change
Filter drinking water through cloth filters	■ low cost ■ minimal need for outside support ■ local production can provide income for some villagers ■ simple for village to demonstrate and distribute	■ temporary solution ■ may not be accepted culturally ■ protects only individuals ■ requires adoption of a habitual new behavior ■ effective only against guinea worm
Community sand filters	■ low cost ■ minimal external support needed ■ removes other organisms	■ temporary ■ acceptability uncertain ■ protects only individuals ■ requires new habits be formed ■ requires use of two buckets ■ requires maintenance
Boiling drinking water	■ minimal external support needed ■ kills other organisms	■ temporary ■ culturally unacceptable ■ fuel unavailable or expensive ■ changes water taste

Method	Advantages	Disadvantages
Physical barriers to water source	■ low to moderate cost ■ minimal external aid needed ■ effective if maintained	■ needs maintenance ■ water levels change so may not be useful all year ■ uncooperative people may still enter pond and reinfect
Safe water sources: ■ dug wells ■ borehole wells ■ protected springs ■ rain reservoirs	■ permanently effective if maintained ■ protect against other water- related diseases ■ generally accepted and preferred by community members	■ moderate to high cost ■ external resources needed ■ takes time to plan and implement ■ needs maintenance
Chemical control (Abate, Temephos)	■ relatively quick ■ with training, villagers may be able to apply to themselves ■ protects all users ■ minimal behavior change required ■ also kills mosquito larvae	■ moderate cost ■ temporary solution ■ acceptance uncertain ■ requires use of imported materials ■ requires precise measuring and calculating skill ■ unsuitable for large ponds
Case treatment—bandaging ulcers and/or removing worms	■ with training, village health workers can perform task ■ minimal external aid needed ■ carries ethical value ■ prevents some water source contamination	■ acceptability of covering worm uncertain ■ unskilled workers could cause more suffering ■ diverts attention from prevention ■ ineffective unless all are treated

Note: Health education is essential for promoting the provision, organization, and adoption of each of these preventive strategies through training, communication, and mobilization.

Information in this handout is adapted from *Guidelines for Developing a Plan of Action for Dracunculiasis Eradication Programs*, published by the World Health Organization Collaborating Center for Research, Training and Control of Dracunculiasis at the Centers for Disease Control in Atlanta, in conjunction with Global 2000, Inc.

GUINEA WORM CONTROL STRATEGIES

SHORT TERM SOLUTIONS

PERSONAL ACTION	COMMUNITY ACTION
Case Treatment	Chemical Treatment of Sources
Cloth Water Filters	Sand Filters
Boiling Water	Source Protection
Help Infected People Collect Their Water	
Utilization of Improved Water Sources	Improved Water Sources - Dug Wells - Borehole Wells - Protected Springs - Rain Catchment
[Note that chemoprophylaxis has not been proven nor a vaccine developed]	

LONG TERM SOLUTIONS

CRITERIA FOR DISEASE ERADICATION

Since guinea worm is not the first disease to be targeted for worldwide elimination, it will be useful to explore the lessons about surveillance that have arisen from the efforts to eradicate smallpox, malaria, and other world health problems. Yekutiel (1981) summarizes some of these lessons as six "preconditions" for undertaking an eradication effort:

1. Effective, simple, inexpensive control measures must exist.
2. The disease must be easy to detect as the program advances.
3. The disease must be socioeconomically important.
4. Reasons must exist to go beyond simply controlling disease.
5. Adequate resources and commitment must be pledged.
6. Socioecological conditions must be favorable.

In order to rate the potential for eradicating guinea worm using these criteria, a simple scale can be developed by assigning two points if circumstances are good for meeting a criterion, one point for fair, and none for poor. A rationale for rating guinea worm eradication is described below.

Does one, uniformly appropriate control measure exist for all guinea-worm-endemic communities, as was the case in vaccination for smallpox? Or are there a few effective and simple measures that can be adapted in a national eradication program? Are these measures low cost and easy to distribute? Are there any administrative roadblocks to disseminating the intervention technologies? Will they be culturally acceptable? Are the suggested technologies short or long term in nature, i.e., offering a permanent solution to the problem?

Surveillance is a central consideration in most of these eradication criteria. As eradication succeeds and cases become rare, it becomes increasingly important to detect the few remaining occurrences, a process that depends on the clinical and epidemiological features of the disease. Is guinea worm easy to diagnose under field conditions both physically and culturally?

What is the social and economic importance of guinea worm and the resultant disability? What kind of impact is seen and what groups are affected?

There are financial and political risks involved in launching an eradication effort. As Yekutiel observes, "Even when all criteria [listed above] are met...an eradication program demands the quality of performance and perseverance of such magnitude that there is always danger of failure..." The question therefore is whether it is worth the risk to go beyond disease control and attempt eradication. The effort could be justified if effective control technologies are at danger of loosing their potency (e.g., in the malaria eradication program, due to resistance of vectors to insecticides and disease organisms to drugs), or if the disease is hampering regional or national development.

The precondition of adequate resources is basic since surveillance for eradication requires an extensive reporting network that extends out into the community. These resources become even more important when one considers the socioecological characteristics of a disease like guinea worm because it occurs primarily among forgotten, rural, and remote populations. Are there staff to conduct surveillance and coordinate intervention? Are there adequate supplies of filters? Are water supply improvement organizations coordinated? Is their political commitment on local, regional, national, and international levels?

The socioecological preconditions for eradication include "major population movements, regular seasonal migrations, extreme dispersal of populations in remote areas, and cultural habits and beliefs that cause people to reject certain types of control measures." Conditions include biological factors such as the nature of disease transmission and habitat and the behavior of any disease vectors. In short, does the disease transmission process present itself with some relatively obvious and amenable points of intervention?

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CRITERIA FOR DISEASE ERADICATION

CRITERIA	DISEASE		
	Guinea Worm	Polio	Malaria
Effective, simple, inexpensive control measures			
Easy detection as program advances			
Socioeconomic importance of the disease			
Reasons to eradicate beyond simply controlling the disease			
Adequate resources and commitment pledged			
Favorable socioecological conditions			
Overall Score			

Scoring criteria: good/high = 2 points; fair/moderate = 1 point; poor/low = 0 points.

Maximum score = 12 points.

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These articles will be made available for trainees to borrow or share. Consult trainers for arrangements.

GUINEAWORM CONTROL CASE STUDY: PLANNING A MULTI-STRATEGY APPROACH

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Abstract—The planned global eradication of guineaworm (dracunculiasis) offers opportunities to learn about relatively complicated disease control situations. Unlike smallpox, which was eradicated over 10 years ago through immunization, the guineaworm problem has no one solution, but must rely on a variety of technologies to protect, treat or replace existing unsafe community water supplies which harbour the disease. Experiences in rural Nigeria have shown that a multi-strategy approach is necessary to account for differences in geographical settlement patterns, local culture and beliefs, geology of the area, economy of the villages and political clout of town leaders among the five major segments of the community. Through a self-help primary health care programme, residents of the Idere community were able to dig wells, produce and distribute cloth water filters bringing a reduction in disease incidence in some areas. It was also seen that generally low standards of living exacerbated by scattered outlying settlements made self-help difficult. Unfortunately occasional government and private efforts did not succeed because of a lack of community participation. Programme planners must involve the consumers in diagnosing these community characteristics and in planning, supervising and maintaining the resulting projects. The multi-strategy approach will help avoid wasted resources and false expectations that arise when project staff attempt to apply a "magic bullet" solution to a complex problem.

Key words—guineaworm, multi-strategy, self-help, health education

BACKGROUND

Guineaworm, a disabling water borne helminthic disease, is currently targeted for elimination in several countries, with the hope of global eradication before the end of the 1990s [1]. This ancient disease is now confined to rural areas of south Asia and Africa in communities which have not yet enjoyed the fruits of national development, especially improved water supplies. Eradication of guineaworm therefore serves as more than a means to alleviate human suffering. India embarked on its eradication campaign in 1982. Pakistan, Nigeria, Ghana and other endemic countries have followed suit [2–4]. Elimination of this disease is also a metaphor for improving the lot of poor neglected third world populations.

Guineaworm eradiction efforts can learn from programmes aimed at smallpox and malaria [5, 6]. Smallpox eradication differed from that of guineaworm in that there were no intermediate hosts and fortunately only one proven, portable and relatively inexpensive prevention technology, immunization, that could be applied against the problem. In guineaworm the intermediate host or vector, the cyclops, is not as mobile and ubiquitous as the mosquito, but like malaria, there are a variety of interventions to solve the guineaworm problem.

In short guineaworm may be easier to eliminate than malaria because its vector is not very mobile and transmission is linked only to the drinking of unsafe pond water. On the other hand guineaworm eradication efforts may be limited by the fact that multiple strategies exist for its control, none of which is perfect for all situations.

Apart from the technical lessons, previous disease control programmes have shown the need to understand and account for the human behavioural aspects of disease transmission, prevention and treatment [7]. It is often the behaviour, not only of the consumer of services, but also the provider that is responsible for programme lapses.

It is the purpose of this case study to demonstrate the issues involved in selecting an appropriate mix of guineaworm eradication interventions by using the experiences of a small Nigerian community of 10,000 in the western corner of Oyo State. The case study focuses primarily on intervention planned through a self-help community primary health care programme over the period 1978–1988. During this time other agencies made sporadic contributions to guineaworm control, and their efforts will be described too, to contrast community-based activities [8, 9].

Interventions to solve the guineaworm problem can be divided into four broad types as listed [10–13], and can be grouped as short or long term solutions as seen in Fig. 1.

1. Protecting Existing Sources—barriers to ponds, platforms, volunteer guards, help in water collection for those afflicted.
2. Treating Existing Water Sources—
   a. At The Source—community sand filters and methods to kill the intermediate host (cyclops species) such as chemicals and fish.
   b. At Home—cloth filters, boiling water.
3. Providing Alternative Sources—hand dug wells, tube wells, bore hole wells, rain water harvesting, tanker services.
4. Appropriate Case Treatment—dressing of open guineaworm ulcers can be viewed as a control measure since this may keep infected people out of village water sources, but this option is not a major focus in this paper.

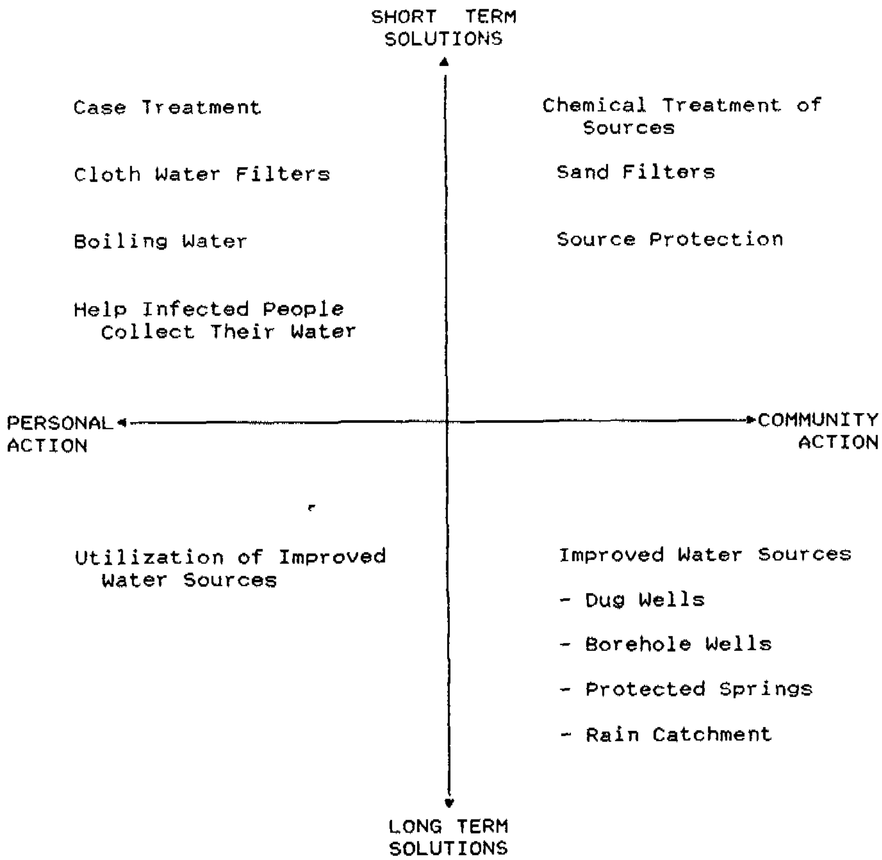

Fig. 1. A matrix of guineaworm control strategies.

The choice of technologies depends on several factors. Geology determines availability of water both above and below ground. Geographical issues such as settlement patterns influence the concentration of people who may be accessible to a given control technology. Climate determines seasonality of water sources and transmission of disease. The economy puts limits on what control methods are affordable. Culture has an impact on which options may be acceptable. Politics enters into the allocation and siting of any valuable resource.

At issue is not only choice among multiple disease control technologies, but also identification of human behaviours required for acceptance and utilization of the appropriate interventions. A careful assessment of these behaviours and the factors that may influence their adoption will lead to what Green and associates call an 'administrative diagnosis,' or the selection of an appropriate mix of educational and promotional strategies [14].

THE COMMUNITY

Idere, a small town in western Nigeria, consists of two main sectors, a dense settlement of 8000 residents and 40 scattered farm hamlets containing another 2000 people. The largest hamlet is 300, the smallest 15, with an average of 50 members. The closest hamlet is 5 km from town and the furthest about 30 km. A few hamlets are clustered, but most are at least 5 km apart. Mobility between town and hamlets is high, especially on weekends and festivals, since all hamlet residents belong to an extended family compound in the main town to which they will retire when they stop farming.

Pipe borne water was installed in the main town in 1968, but the system began to break down in 1975. By 1980 the taps flowed at most once a month, and then only to the eastern third of town. Since the hamlets never enjoyed pipe water, they served as a reservoir of guineaworm infection. Annual incidence of the disease, which had been reduced to near zero in the main town, climbed to 20% in the late 1970s and reached 43% in the 1980–81 dry season, the period of usual transmission [15].

Control of guineaworm in Idere began in 1978 with efforts by staff and students of the African Regional Health Education Centre in the Department of Preventive and Social Medicine at the nearby University of Ibadan to organize community based primary health care (PHC) [16]. Ten farm hamlets were the initial concern. The programme was expanded to the whole of Idere in 1983 when funds were provided by the UNDP/World Bank/WHO Special Programme of Research and Training in Tropical Diseases (TDR) to study the social and behavioural aspects of tropical diseases in the context of primary health care (PHC) [15].

Initial advocacy by community leaders and University staff to get the water corporation to reactivate the pipe system failed. The corporation was strapped for funds and often could not buy needed chemicals or diesel fuel to run generators or to repair broken mains. Recently that agency has embarked on a new policy of cost recovery. It closed down over two-thirds of the public standpipes in the district and told residents that it was interested only in offering paid connections to homes or compounds. Community response to the new arrangement was not positive because people felt the water corporation was unreliable. The self-help PHC approach seemed to be the only alternative at the time.

A follow-up TDR project examined the social acceptability of monofilament nylon cloth home based filters for guineaworm control during 1985–86 [17]. Since that time those involved in the project have concentrated on strengthening the local PHC organization which consists of an association of volunteer primary health workers (PHWs) and on further study of the social and economic issues surrounding guineaworm [9, 18, 19].

Experiences in Idere have shown that for planning purposes, the community consists of two main sectors, the town and the hamlets, and several subsectors [20], as described below.

The main town

Within Idere town the gradient of annual guineaworm incidence increases from east to west [21], since the eastern third of town still has access to occasional tap water. Also the eastern section contains most of the new houses in town, and the residents are somewhat better off economically than those in the old part of town.

The old or west end of town can again be stratified. The northern slope abuts a huge granite inselberg. No one can dig deeper than one meter without hitting rock. Only two inaccessible seasonal springs are found here. The southern edge of town borders a marshy area that contains 17 ponds and waterholes dug out by local residents. These are the key guineaworm transmission sites. Not only are these ponds convenient, but they also have economic (gardens) and cultural (ancestor beliefs) significance. These ponds provide free, accessible but unsafe water throughout the year, though their volume is greatly reduced in the dry months (which enhances transmission as the concentration of cyclops is higher). Such waterholes are roughly 5–7 m in diameter and have been dug to an irregular depth of 3 m in some places.

The middle strip of town, which lies along both sides of the main street, is fortunate geologically as shallow wells can be dug along its entire length. One problem is that the clay soil causes wells without strong lining to cave in. Also traditional well diggers in Idere are afraid to dig below the water table, so that local wells are usually only 6 m deep and dry up during the months of January to March.

The farm hamlets

The hamlet sector can be divided into a northeast (NE) cluster of 16 villages and a western grouping of 24. The NE cluster is easily accessible to the main town stretching between 5 and 15 km along a motorable dirt road. Being accessible, most NE hamlets participated in the volunteer PHW training programme. Resident PHWs, serving as communication links with modern health services, have had positive influence on traditional beliefs and practices.

Western sector hamlets are more isolated as they lie across the Ofiki River. During about four months of the dry season the river can be crossed by foot or vehicle, but even then the closest hamlet is about 10 km. When the river is full, one must first travel north of Idere about 20 km to find a bridge. Transport to this side is expensive and irregular. Visits by health, agricultural and other workers are rare, making supervision of projects like guineaworm control difficult.

Generally the farm hamlets are relatively poor. Cash is not available year round. Hamlets are often too small and distant from each other to be able to mobilize funds for cooperative projects like village wells. Numerous streams surrounding these hamlets provide possible sites for wells, but the sandy nature of the soil near them led to the collapse of the few wells that were attempted. Also a number of hamlets have been sited on hills or ridges where wells will not yield.

From the social perspective, hamlet residents are reluctant to make major investments in their settlements. They view their tenure in the village as temporary, knowing that eventually they will return to the family house in town. Most hamlets have existed for one or two generations, so the concept of temporary in Idere is quite different from that of the outside observer.

Local beliefs

An important belief pervades the general community, but particularly the old part of town, that guineaworm is actually part of one's body, like a tendon, and therefore cannot be prevented. Idere people define the disease somewhat differently than do epidemiologists. While they easily recognize the open ulcer, a protruding worm and the pain that precedes and follows the ulcer, they also consider many swellings or nodules under the skin, stomach aches and other body pains to be caused by guineaworm. In other words since guineaworm is already in the body, it can create a variety of problems without ever coming to the surface. These perceptions, if not understood by the heath worker, make communication and surveillance (i.e. case definition) difficult.

Traditional treatment is preferred to modern because belief and fact coincide that western drugs do not actually cure the disease. Local herb and oil mixtures offer some soothing effects without the cost and inconvenience of clinic visits. Traditional management is conservative. People are horrified by aggressive care that attempts to remove the worm or bandage the site as this may anger the already troublesome worm [22].

The long incubation period of the disease (9–12 months) also makes it hard for people to visualize the direct connection between the water they drink today and the disease they suffer next year. Residents point to people who have drunk Idere pond water all their lives, but never got guineaworm. Conversely they cite tales of Idere citizens living in the capital city who still get the disease. Their logic is that either one has the disease in him or he does not. Bad or weak blood, a local divinity, Soponna (who is responsible for rash-like diseases) or the smell of an open guineaworm ulcer on another victim are said to be the immediated reasons why the worms emerge.

Under these circumstances Idere people often feel proposed guineaworm prevention and treatment options have low efficacy. Since western medicine offers no 'cure,' health workers' advice about guineaworm is held in low esteem [22]. Even among more enlightened residents who believe the disease can be prevented, there is a feeling that filters are a second rate solution. In fact filters do wear out after a season's continuous use. Therefore intervention proceeded cautiously under these limitations.

INTERVENTIONS

From the foregoing one can see that no one control technology would offer complete technical feasibility nor total social acceptability. Experience dictates that even if a partially successful intervention were applied and the disease was quelled in one sector, it could easily return from a neighbouring locality. To account for these social and technical problems, planning in Idere was multi-disciplinary and involved the community. The technical skills of various cadres and sectors were drawn upon including health education, medical anthropology, hydrology, medical geography, microbiology, epidemiology, general medical practice, environmental sanitation, community development and public health nursing.

Local leaders and a committee of volunteer PHWs provided regular community input and direction to planning [9]. This guaranteed that proposed action made sense to the community at large, lined up with their priority needs and fit into local resource capabilities.

The Idere PHC programme used two main guineaworm control interventions—dug wells and monofilament nylon filters. Experience has shown where additional methods would have been helpful, and these are noted where applicable. The appropriate health education strategies used to promote these technologies were community organization to mobilize resources for community and family dug wells and social marketing to encourage adoption of the monofilament filters. A brief description of the activities and results in each sector follows and is summarized in Fig. 2.

Wells and filters in town

An initial programme thrust within the town proper was family wells. The town is divided into 75 extended family compounds with an average of 100 members. Educational efforts by the volunteer PHWs focused at the compound level. The number of family wells increased from 10 in 1980 to 60 in 1983, 80 in 1985 and 140 in 1988. Many people living in the southern edge of town still preferred free pond water, while those on the northern slope could not dig because of rock and also resorted to ponds. Problems of low yield in the dry season and collapse in the heavy rainy season persisted.

In 1985 PHWs organized fundraising for model cement ring wells. In March 1986, two 10 m deep ring wells were commissioned, both located along the central strip and convenient for people living in the northern and central areas of town. People on the southern edge still found pond water more convenient. The idea of the cement ring wells as models has not caught on for the family level because their cost, while modest by some standards ($225 U.S. at current official exchange rates), is several times higher than the traditional dug wells (U.S. $40) and compares to an estimated annual per capita income in the community of U.S. $50 [21].

The PHWs have maintained these two wells and raised funds for and constructed a third well in the southwestern part of town in early 1990. They charge a small fee (about $.02 U.S.) per bucket as part of their fundraising efforts.

Table 1. Guineaworm control options by sector in Idere

Sector	Characteristics	Control options
Main town		
Eastern Third	occasional piped water; newer houses; better economically; shallow ground water; about 1500 residents	neighbourhood cement ring wells; cloth filters as backup
Old Town/North Slope	borders granite inselbergs; not possible to dig wells; inaccessible seasonal springs; about 1500 people	water tanks; rain catchment reservoirs; cloth filters
Old Town/Central Strip	easy to dig shallow wells; clay soil causes cave-ins; local well diggers fear to dig far below water table; about 3000 residents	neighbourhood cement ring wells; cloth filters as back-up
Old Town/South Edge	borders marshes and ponds; pond water is free and accessible; traditional beliefs strong that guineaworm is part of one's body; sandy soil causes wells to collapse; about 2000 people	sand filters near ponds; abate put in ponds by trained PHWs; cloth filters; protect ponds; support/help those affected get water; neighbourhood wells
Farm hamlets:		
Northeastern Cluster	access to town (5–15 km); PHWs active and have positive influence on attitudes and beliefs; soil problems; dug wells collapse; settlements small, scattered; farmers have less access to ready cash; about 800 residents in 16 hamlets	cloth filters; oil drum wells; sand filters near ponds; abate applied by trained PHWs; save money for ring wells later
Western Cluster	same problems as northeast plus distant from town (20–40 km); few active PHWs; several hamlets on ridges and far from streams; about 1200 residents in 24 hamlets	cloth filters for meantime; other options inhibited by poor transport and costs

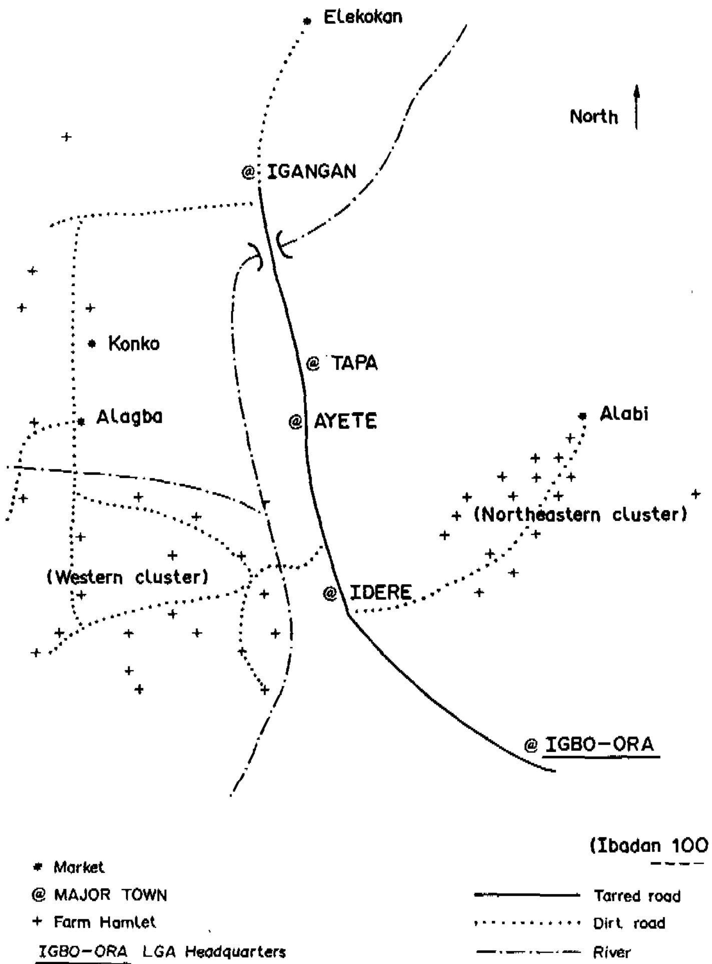

Fig. 2. Sketch map showing Idere town and hamlets, Ifeloju local government, Oyo State, Nigeria.

During the period the annual incidence of guineaworm on the main town fell from 43% in the 1980–81 dry season and now hovers between 10–15% since 1986. Annual surveys by medical students as part of their community health rotation in the local government have shown a persistent pattern of continued low incidence in the eastern third of the town (3–5%) while the annual number affected ranges upwards to 20% along the northern slope and southern edge. Residents in the central strip experience intermediate levels.

During the 1985–86 dry season the PHWs were involved in production, promotion and sale of monofilament nylon filters that fit over local drinking water pots. Filter cloth and support funds were provided by TDR. In the main town about one-quarter of households purchased. The main reason cited for not buying was lack of money. The cost of the filters ranged from U.S. $.20 to $.35 (approximately the cost of a bottle of beer or a couple of soft drinks, items which residents purchase relatively frequently to entertain guests). Informal interviews revealed that many people still did not believe that guineaworm can be prevented, since as noted it is felt to be part of one's body.

Filter sales were best in two locations, family compounds where the PHWs actually resided and compounds where there were wells. It turned out that the latter group (which often overlapped with the former) was more health conscious and saw the filters as a backup protection in case their wells would go dry.

An important aspect of the filter project was that money raised from the sales was used towards construction of the two cement ring wells. This shows a synergy between short term and more permanent interventions. At present the PHWs are continuing to make and sell filters from cloth left over from the TDR project, but when this runs out it will be impossible to replace the cloth and sell filters at the same price because of severe devaluation of the Nigerian currency. In other words filter costs would rise by as much as seven to ten times.

Other control efforts

Attempts to control by other agencies are worth noting. In 1981 a voluntary organization, in the state capital, on learning the plight of the Idere people, donated two 500 gallon water tanks to be placed at strategic locations in town. Unfortunately the local residents expected the state water corporation to fill the tanks for free, since the tap water was free when it had flowed in the town. Although the cost of a tanker truck of water was not exorbitant (about U.S. $2), no one was clear on whose responsibility it was to make arrangements. Though well intentioned, the donors did not undertake the advance community organization that was needed to make the tanks useful.

A private intervention was attempted in 1982 when owners of water tankers from neighbouring towns came to Idere. An oil drum of water sold for about U.S. $.40. They found very few customers and stopped selling after a couple of months. Interestingly this approach did work in a town about 30 km north of Idere.

In addition to private efforts, the local government had constructed two wells back before pipe water was brought to town. Both still yield, but neither are being maintained and consequently have no cover and are often full of debris. Both serve the central and southern sections of town. In 1987 the local government also gave out a contract to sink two dug wells with handpumps in the same general area. Within a few months both of the pumps stopped functioning, and no one returned to repair them. Interviews with community members found that none knew who was responsible for these pumps.

Finally a Federal Government and UNICEF borehole well was installed near the maternity centre at the eastern end of town, against TDR team geologist's recommendation, and yielded no water. His surveys predicted low yield throughout the Idere community, making this a costly and less desirable intervention (though socially townspeople feel that a borehole is better than a hand dug well). This is an example of government policy being followed to the letter, regardless of whether it is technically feasible under local circumstances and without consulting experienced local staff and community members.

Possible alternatives

These experiences suggest the addition of other control technologies targeted to each sector. The pesticide Abate (temephos) might be applied by trained PHWs in ponds along the southern edge of town. PHWs have organized themselves to maintain a revolving community medicine fund and could likewise manage stocks of the chemical. Abate must be supplied through external assistance as it is not available for direct purchase.

An experimental community sand filter was placed near one Idere pond in 1984 [12]. The design could be improved and funds might be raised so that additional filters could be situated near other ponds. PHWs would play a major role in mobilizing resources, educating pond users and maintaining these sand filters.

A more systematic approach to water tanks or rainwater reservoirs might be tried along the northern slope. The rocks might be a good base on which to build cement block reservoirs. Again PHWs could lead this community organization effort.

Activities in the farm hamlets

Intervention in the farm hamlets also concentrated on wells and nylon filters. In the early stages (1978–79) there was also some attempt at pond protection. PHWs live in 12 of the 16 NE hamlets. In the early phase of activity village wells were dug in several hamlets, but all collapsed due to sandy soil. Not long after, a local government well was sited near one of these hamlets not far from their defunct well. Since the villagers had taken previous effort to help themselves, their PHW easily organized the people to maintain this new well. They put a lock on the lid and during the dry season rationed the water among themselves. These initial activities were shown by 1981 to break guineaworm transmission in some hamlets and greatly reduce it in others [15].

When filters were introduced in 1985, most families enthusiastically bought one from their resident PHW. The constant mobility between town and hamlet means that vigilance is needed to prevent reintroduction of infection. Also filters need to be replaced annually as frequent use leads to small holes.

Since these NE hamlets have responded well to intervention, an experiment is currently under way to provide temporary wells made from old oil drums. A well two or three drums deep located near a commonly used pond is cheaper than the cement variety. Donations of drums were sought from the capital and transported on University vehicles that regularly visit the field. A local tinker removed the bottoms of the drums, smoothed out the surfaces and made a lid for the top drum. Community members, once accepting the idea of the drum wells, dug the site and inserted the drums. Total cash outlay amounted to about U.S. $5 per drum well.

In recent years government has sited four more dug wells near the NE hamlets. Unfortunately none yielded adequate water. Even if the wells had functioned, there would have been disputes on ownership and maintenance since the wells were sited to serve three or more settlements. Though small (50–80 people), each hamlet feels it deserves its own well.

Two other technologies that might be appropriate to these hamlets would be maintenance and application of Abate by trained PHWs and construction of community sand filters. A system of social support where neighbours who are not affected help their infected neighbours collect water has been organized in some Ghanaian villages [23], but the combination of filters and drum wells seems most workable here.

A problem sector

PHWs are found in only 12 of the 24 western hamlets. Three hamlets attempted to dig wells in the late 1970s, but met trouble as two were located on ridges and the third in a sandy area. Filter sales were fair in the 12 villages and poor in the remaining hamlets. Most of the sales here were made by project staff.

The western subsector presents the biggest challenge to community control efforts. Its relative isolation inhibits PHW training and supervision. The distance makes transporting resources more costly and cumbersome. Unless control efforts succeed in this area, a guineaworm reservoir will remain that can easily spill over into other settlements as happened once before.

Furthermore experience with the western hamlets points out clearly what was only hinted at in other areas, community self-help alone cannot solve the guineaworm problem. Unfortunately the history of government resources poured into Idere does not paint a successful picture either. Such projects lacked thorough planning, community involvement, monitoring and maintenance. Of course this is not unique to Idere. Problems of lack of maintenance and distance to wells have plagued government and UNICEF borehole well projects in other Nigerian states where guineaworm transmission has continued in spite of expensive intervention [24, 25].

CONCLUSION

Idere is not unique in its effort to control guineaworm. University staff have helped two small villages in Oyo State, Igbon in the north [26] and Elesu in the east [27], eliminate their guineaworm problem through community effort. Similarly hamlets within NE sector of Idere, like Onileka and Ajelaunwa, have been able to stop the parasite [28]. The Idere experience looks beyond the success possible in individual motivated villages to the variety of communities within a micro-region. The constant movement and interaction among settlements demonstrates that while one hamlet may appear to free itself from the disease, it will still be at risk if its neighbours harbour the worm.

The Idere programme demonstrates that even in a small community, there are different sections, which due to variations in geology, geography, economy, social structure, health resources and beliefs, require different guineaworm control technologies. Consequently very thorough community assessment is needed before control efforts are undertaken. Planners should learn about the community and listen carefully to local community members and workers who have a wealth of practical experience.

The experience in certain sectors of Idere also shows how community self-help can make a major dent in the guineaworm problem. It also shows that poor, rural communities where guineaworm attacks, do not usually have all the resources needed to solve their problems alone. Unfortunately external resources will be wasted unless communication between planners and community members is established and guarantees regular feedback. Community members must also be involved in project supervision. Guineaworm control requires a commitment at all levels from individual households to various government and non-government agencies.

The above conclusions imply that isolated interventions will not succeed. Control must be integrated into ongoing service. Supervision and maintenance of both complex wells and simple filters are needed if these technologies are expected to work.

Although guineaworm is not a killer disease of worldwide proportion, it deserves the attention of all health planners. Disease eradication programmes currently under way should learn from the Idere experience about the management of a multi-strategy approach to disease control generally and specifically to apply this approach to guaranteeing adequate and safe water supplies in rural communities.

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Farmers' loss due to Guinea worm disease: a pilot study

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Summary

Guinea worm disease has been blamed for much disability and loss of productivity among farmers in Africa and South Asia. Many studies have tried to equate days lost in illness to monetary values. These attempts often overlook the process of disability in relation to farming patterns. This pilot effort uses a qualitative case study approach to learn about how Guinea worm can cause loss to farmers. Twenty in-depth interviews with affected farmers showed that their losses are related to the time of year they are affected by Guinea worm. Some crops with flexible planting times, e.g. cassava, may not be as affected. Duration of disability is another determining factor. Insights from this pilot study can be used to design more appropriate large-scale survey instruments and guide development of longitudinal research.

Introduction

Guinea worm, a water borne helminthic disease, is responsible for much morbidity and disability in the rural areas of Africa and South Asia. The disease is thought to have a major impact on community and household productivity because it often occurs during period of peak farming activity (Ward 1985). The pain of a metre-long subcutaneous worm and the frequent secondary infections of the ulcers where it protrudes, are causes of the severe disability experienced by those infected (Kale 1977; Hopkins 1983). Varying durations of illness and disability have been reported ranging from 3–5 weeks (Nwosu *et al.* 1982; Reddy *et al.* 1969; Belcher *et al.* 1975) up to 9–14 weeks (Kale 1977; Ilegbodu 1986; Brieger *et al.* 1988). The extent to which this disability reduces productivity and results in economic loss is an important area for research (Ward 1985). In fact, although various studies have pointed to a substantial effect of the disease on agriculture, none has properly measured it (Hopkins 1983).

The number of studies on the economic and social consequences of parasitic tropical diseases is small (Rosenfield *et al.* 1984). Even in those studies, little attention has been paid to social and cultural forces (Weisbrod 1973). The failure to quantify and qualify disease consequences has in part contributed to the poor level of funding for control efforts (Rosenfield *et al.* 1984).

Studies have often attempted to measure economic loss by multiplying days absent from work by average individual daily income (Rosenfield *et al.* 1984). Generally, the results of these labour-efficiency studies have been inconclusive (Rosenfield 1979). In broad terms it has been estimated that for every 6% of the population aged 15–45 years affected by Guinea worm, approximately 1 day of productivity per worker is lost annually (Ward 1985).

A recent study on Guinea worm in the rice producing areas of eastern Nigeria surveyed 87 households wherein an estimated 19 854 man-days were lost to Guinea worm at a value of US $1.13 for rice output per man-day (de Rooy *et al.* 1987). The result was extrapolated to the whole region producing an estimated annual loss of over US $20 million. Unfortunately, this approach ignores important distinctions between normal and peak periods of labour and does not take into account coping methods (alternative crops, hiring of labour, etc) that attempt to alleviate the problem (Rosenfield *et al.* 1984).

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Innovation in study methodology has been called for with an emphasis on interdisciplinary input (Rosenfield *et al.* 1984). The pilot study described herein uses a qualitative case study approach to gain insights into the process of disability and loss, and from these makes suggestions for larger-scale research.

Methodology

Idere in Oyo State is a rural Nigerian community of 10 758 residents as found in a 1981 total population survey (Brieger *et al.* 1984). The community depends primarily on agriculture, although only 16.7% of the population are full-time farmers. Most other adults engage in part-time farming to supplement their income and provide food for the family. The major staple crops, which are also sold commercially, are maize, cassava, melon seed and yam. Annual per capita income has been estimated at ₦500 (US $125).

Guinea worm is endemic in Idere and the prevalence has fluctuated over the years. Piped water was installed in the main town in 1968 but broke down by the late 1970s. During the household survey noted above, over 40% of the people were found to have been affected in the 1980–81 dry season (Adeniyi & Brieger 1983). Community interventions have resulted in a decrease, but in 1987–88, the period of this study, medical student surveys found that 15% of the population were affected with the disease.

A case study methodology was employed in this pilot work to identify what happens to the local peasant farmers when Guinea worm strikes. Through the help of resident volunteer primary health workers, all sections of Idere town were visited and 20 farmers who had suffered from Guinea worm between October 1987 and May 1988 were identified for study. This period is defined in two 'seasons', autumn/winter (October–January) and spring (February–May). Rains begin any time from March, so the planting of many crops occurs in the spring.

In-depth interviews, conducted with the help of medical students from the University of Ibadan, sought information on time and duration of illness, crops usually planted, and crops the farmers could not plant because of Guinea worm. During interviews undertaken in June 1988 farmers were asked to recall their experiences since the onset of the most recent Guinea worm season (October 1987). The study depended on the subjective estimates of the farmers based on the yields they normally experienced from their land. Acres not planted were converted into potential yield (bags of maize, melon, cassava flour or heaps of yams) and these were multiplied by the current market value of the crop to estimate potential loss. At the time of the study ₦1.00 equalled approximately US $0.25.

Data analysis is primarily descriptive with emphasis on processes and trends observed. Therefore the evidence should not be taken as conclusive, but should be seen as a guide for developing larger-scale projects.

Results

The age of the 20 farmers ranged from 27 to 68 years with an average of 45. Their farms were small, averaging only 4.3 acres (1 acre = 0.4 hectare). The smallest was only 1.5 acres and the largest was 10 acres. These are the farmers' own estimates and experience dictates that their concept of an acre may be slightly smaller than the standard acre. The closest farm was half a mile from town, and the farthest 12 miles, with the average being 4.3 miles (1 mile = 1.6 km).

The 20 farmers were down with Guinea worm from 1 to 7 months, with an average of 3.9 months. Their disability during illness ranged from difficulty in walking (1 farmer) and walk with aid of stick only (2) to bedridden (17). The time of infection varied with eight affected only in the autumn/winter (October–January), three were affected from February to May only, while the rest had infections spanning both periods.

Three farmers grew all four staple crops studied, four grew only two of the crops, while most grew three. Maize was grown by all, cassava by 17, yam by 13, and melon by eight. A variety of supplementary crops was also grown including tomatoes, vegetables, beans and peppers. These were used primarily for home consumption.

Table 1. Crop losses experienced by Idere farmers

Crop	Growers	No. who lost*	Amount lost (bag/heap)	₦ Price per unit	₦ Value lost
Maize	20	10	64.5	200	12 900
Cassava	17	4	90	100	9000
Yam	13	8	26.5	100	2650
Melon	8	3	17	120	2040
Total					26 590

*Lost: unable to plant the crop at all or as much as planned.

Table 2. Season of illness compared to crops lost

Crop/loss experienced	Season: October/January only	Season: Including February–May	Total growers
Maize			
Yes	1	9	10
No	8	2	10
Total growers	9	11	20
Cassava			
Yes	0	4	4
No	8	5	13
Total growers	8	9	17
Yam			
Yes	6	2	8
No	2	3	5
Total growers	8	5	13
Melon			
Yes	0	3	3
No	4	1	5
Total growers	4	4	8

Losses were experienced in all crops due to inability to plant. Eight yam growers reported losses totalling 26.5 heaps, four cassava planters lost a total of 90 bags, three melon farmers lost a total of 17 bags, and half experienced a loss of maize totalling 64.5 bags. The validity of these estimates was confirmed by two experienced local research assistants who have often assisted the author and who have their own farms near Idere. The total loss amounted to ₦26 590 (Table 1). Only four farmers reported no potential loss. Three had severe disability (bedridden) but were sick for only 1 month. The fourth, though sick for 3 months, was able to walk with only some discomfort. Judging from the 1981 survey of all Idere households and the Guinea worm prevalence for 1987–88, it is possible that 270 full-time farmers may have been infected with Guinea worm. If the average loss of the 20 farmers studied equals ₦1329.50, then the estimated loss to the community could reach ₦358 965, or close to US $90 000.

The seasonality of infection and farming activities becomes evident when each crop is considered separately (Table 2). Maize is planted in the spring after the rains. A second crop can also be planted later in the rainy season. Of the 11 maize farmers who were affected with Guinea worm in the spring, nine could not plant the amount of maize they desired. Of the two who could plant fully, one became sick only in May, while the second was sick for only 1 month. Only one of the nine affected in the autumn reported loss. This person had Guinea worm from August to October and would have planted his second maize crop in August.

Cassava is often planted in the spring but can be planted throughout the rainy season. No cassava grower who was sick only in the autumn had problems. In contrast, four of nine who were affected in the spring experienced loss. Those five who experienced no loss still had cassava in the ground and would not be ready to plant a new crop until around August.

Yams are planted primarily right after harvest time when dried maize and guinea-corn stalks can be used as supports when the seedlings sprout. Six out of eight yam growers who had Guinea worm in the autumn could not plant as desired. The two who did not lose were sick for only 1 month each. Yams can also be planted in early spring and among the five ill at this time, two experienced loss as they were late planters.

Melon is planted after the rains. No melon growers who were sick in the autumn/winter suffered loss on this crop. Three of the four who were sick in the spring did lose; the fourth did not come down with Guinea worm until May, after planting was over.

Discussion

This pilot study has provided reason to suspect general 'days lost' surveys. It becomes obvious in the context of peasant agriculture that days down with illness do not always translate into direct financial loss. The timing of the illness may not coincide with the planting of a particular crop. The duration of the illness may be short enough to allow the farmer to compensate for the days lost. Some crops have flexible planting dates. The disability level may be small enough to allow the farmer to get around.

The duration of illness reported among these farmers (3.8 months or about 15 weeks) is on the high end of the spectrum but not much different from the 100 days (or about 14.3 weeks) reported in the nearby Ibadan District by Kale (1977). Of course, a sample of 20 farmers may not be representative, but the unhygienic treatment practices used in Idere often lengthen illness by predisposing to disabling secondary infections (Ramakrishna 1985–86). It should be noted though that the emphasis of this study is not on quantitative data. The qualitative issue of seasonality provided the key to unravelling the means by which disability hindered agriculture in Idere.

Also important is the need to recognize that peasant farmers produce multiple crops. Therefore one episode of Guinea worm is not likely to jeopardize everything a farmer has. Cassava may serve a similar function in Idere to that which it serves for farmers in Paraguay where its flexible planting and harvesting periods offer an 'insurance policy' against times of illness and disability (Conly 1975).

This study is not intended to imply that the loss to the individual farmer equals all his potential profits were the desired crops planted. Seeds must be bought, tractors rented and labourers hired, but as most of these resources come from within or near the Idere community, the predicted value *is* a loss to the entire community. Also, the results should be considered with the limitation that they do not reflect the health care expenditures which usually result from illness (Rosenfield *et al.* 1984; Weisbrod *et al.* 1975), nor do they account for some of the social disadvantages that accompany Guinea worm (Edungbola & Watts 1985). Still, the findings do point the way toward further research.

It is clear that future surveys can gain from the insights of qualitative pilot studies. Survey questions should account for the seasonal pattern of planting as well as the variations in the onset and duration of each illness episode and the resulting disability. The need to inquire about each staple crop is also evident. Inquiry needs to be made into the various coping mechanisms local farmers have adopted. Even more significantly, the case study results imply that longitudinal study, through at least one annual cycle, is required to provide a true picture of the process of disability and all its consequences.

Finally, impact studies often compare the benefits of prevention against the cost of intervention (Rosenfield 1979). Control efforts in

Idere so far have promoted monofilament nylon water filters as a short-term measure and cement ring dug wells for long term (Brieger *et al.* 1986–87). At a cost of US $3.00 per filter each of the approximately 2000 Idere households could be supplied at a cost of $6000. If an average of 300 persons per well is used, the main settlement of Idere would require 27 cement ring wells. One well for each of the 40 scattered farm settlements is also needed. At an estimated cost of US $300 each, a total of US $20 100 would be needed for wells. The cost of these two interventions amounts to only 29% of the rough estimate of the losses suffered by the full-time farmers alone during the 1987–88 Guinea worm season.

Clearly the benefits of Guinea worm control in Idere would outweigh the costs of the simple interventions just noted. So far, Idere residents have borne most of the costs of preventive action either by buying their own filters or contributing money to neighbourhood well projects. Progress through self-help has been slow but measureable in this poor community. It is to be hoped that the Nigerian Guinea Worm Eradication Programme which is now under way will help mobilize additional external resources to speed up control efforts in Idere.

In closing, it is instructive to summarize a focus group discussion that was held among women living in one of Idere's small farm hamlets where Guinea worm was eliminated through self-help 7 years ago (Brieger *et al.* 1988). They observed that their houses now have corrugated iron sheet roofing instead of the traditional thatch found in most of the surrounding hamlets where Guinea worm is still rampant. They attributed this improvement in living standard to their present ability to work throughout the year. The women say that their families now have enough money to pay children's school fees and other expenses that were difficult to meet some years ago. While these perceptions are subjective, the women do strongly believe that the elimination of Guinea worm is responsible for the improvement of their lives and the development of their village. It may be hoped similar development will occur throughout Idere when more national attention is drawn to the plight of the farmers who suffer from Guinea worm.

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Case Studies

COMMUNITY INVOLVEMENT IN SOCIAL MARKETING: GUINEAWORM CONTROL*

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ABSTRACT

Social marketing as a health education strategy has the potential for encouraging the adoption of new health technologies. The focus on the individual, though, holds the risk of victim blaming. This can be overcome if the consumers/community are involved in the four major components of the marketing strategy—product design, price, distribution and promotion. The community of Idere, Nigeria, has recently been involved in marketing a monofilament nylon cloth filter to prevent the water-borne helminthic disease, guineaworm. Local tailors produced the filters. Volunteer primary health workers debated pricing, sold the product and educated each consumer. Coverage in those neighborhoods and farm settlements where primary health workers were resident was nearly double that of other sections showing the value of local action to market health changes.

Social marketing has been heralded as the new strategy that will enable health education to make an impact on a mass level [1]. Like new ideas in general, this application of commercial marketing concepts to the promotion of socially desirable goals is met with skepticism of both the ethical and programmatic varieties. The staff of the African Regional Health Education Centre (ARHEC) in Ibadan, Nigeria, were aware of these drawbacks when the idea of using social

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marketing in the control of guineaworm disease arose. Yet they felt that social marketing could be adapted to the principles and practice of community health education if proper attention was given to the need for consumer involvement.

ETHICAL CONCERNS

Two major ethical problems make the health educator reluctant to give full consideration to social marketing strategies. The most obvious concern is the link between social marketing and its commercial counterpart which is perceived as persuasive, if not coercive, and therefore many steps away from the desired notion of voluntary behavior change [2]. Marketing appears to be a process planned by professionals with little room for active and meaningful consumer involvement.

A second and sometimes less articulated issue is the focus of social marketing which is more toward individuals than institutions or society. This opens up the problem of victim-blaming [3]: sell a product, service or idea that will help the individual cope, while leaving the unhealthful social and economic system unchanged. One senses this problem even at the methodological level. Marketing has relied traditionally on media or information strategies aimed at individual consumers. Such strategies cannot redress structural faults and often fail even to influence the complex etiology of the individual behaviors which they have targeted [4]. The lesson must be learned time and time again that awareness is not enough to bring about change [5, 6].

TECHNOLOGICAL LIMITS

Although social marketing, it is said, does not rely exclusively on selling a tangible product [1], ultimately some artifact, tool, or substance is involved. An agency may promote behaviors like jogging or home-based oral rehydration therapy. The consumer, to achieve these behaviors, may find herself buying new shoes or salt, sugar, and a special sized teaspoon. Therefore even though an agency may not be selling a social or health product, it cannot afford to ignore the technologies which the consumer must acquire and master before she can perfect the desired behavior. This is quite true in the prevention of guineaworm, a water-borne helminthic disease.

While not using modern marketing techniques, health workers have been spreading simple preventive messages for decades throughout the rural areas of Africa and India where guineaworm is endemic. When this painful subcutaneous parasite is ready to expell its larvae, it forms an ulcer on the host's skin to gain access to pond water where the host might wade. The larvae, once liberated in

the pond, are swallowed by a minute crustacean of the cyclops species. When water containing infected cyclops is drunk, the larvae are freed in the stomach of the host, pass through the stomach wall and begin the approximately year-long process of growth and migration. The worm having grown to nearly a meter in length usually aims for the lower limbs to increase the likelihood of its larvae finding a water source.

Consequent to this information health workers suggest that people boil their drinking water if possible or in the alternative, filter it through a clean piece of cloth. The need for sanitary wells is also emphasized or at least a protected source of water into which infected persons cannot wade.

The suggested behaviors sound simple, but existing technologies in poor rural areas for achieving prevention are limited. Fuel for boiling water is often scarce, expensive and time-consuming to gather. Boiling or "cooking" water is also culturally suspect. A square of clean cloth may not be too expensive, but it is awkward to use for filtering, especially when a woman is already tired from walking many miles to fetch the water. Also common cotton cloth becomes dirty quickly from pond water, thereby clogging. Neither does the common cloth have a guaranteed mesh size in its weaving, so some infected cyclops may slip through. Until these problems can be overcome, there is little which is technologically appropriate and feasible that social marketing can promote in terms of individual action.

The idea of a sanitary well, because of the extent of human and material resources required in its construction, is more a community endeavor. This requires community development and organization strategies. Improved water supply has been the main approach to guineaworm control in the past, but because of logistical and economic problems in reaching and serving rural areas, water supply has become a long term goal for many communities. This leaves farmers suffering the debilitating pains of guineaworm with little hope for immediate protection.

Fortunately experiments studying cyclops have led to the discovery of a durable and reliable filtering material, monofilament nylon gauze [7, 8]. The nylon fibers are one continuous strand, not the twisted fibers of traditional cloth which so easily capture dirt. When woven, these single fiber strands form a uniform mesh size like a grid. A guaranteed grid size can be obtained which will block cyclops large enough to have swallowed a guineaworm larva, while at the same time allowing water to flow through smoothly.

The monofilament cloth offers a basic product, which if designed properly could provide the basis for social marketing. This would offer a temporary solution to the guineaworm problem while long-term efforts proceed to provide a reliable community water supply, in other words, a multi-strategy approach to guineaworm control [9]. This approach will address the problem on both the individual and societal levels.

MARKETING STRATEGY

In simple terms there are four major components to a marketing strategy—product, price, distribution, and promotion [10]. The educational input to marketing has traditionally been limited to the promotional end. In order to adapt marketing to health education (as opposed to the other way around), one must consider the issue of consumer participation. The marketing process will become educational only if the community is involved in all four aspects of marketing strategy.

The social marketing project for guineaworm control took place in Idere, Nigeria. Guineaworm has plagued the town and its surrounding farm hamlets since time immemorial, but prevalence rose to new heights when a short-lived piped water system collapsed. Residents of the farm hamlets who account for 20 percent of Idere's 10,000 population, never enjoyed the tap water and served as a reservoir of infection.

Efforts to control the disease began with a pilot program to train community-selected volunteer primary health workers (PHWs) in 1978, by staff and students of ARHEC [11]. This was later expanded with assistance from the UNDP/World Bank/WHO Special Program of Research and Training in Tropical Diseases (TDR). Both guineaworm control and adequate water supply were found among the top four felt needs of the community [12]. The ensuing efforts by Idere PHWs and ARHEC staff resulted in wells in some hamlets and sections of town, but pockets of disease remained due to economic and geological problems [9]. The prospect of personal protection through filters appeared to be a desirable addition to the guineaworm control armory. (See summary of marketing strategy in Figure 1.)

Product Design

Often a consumer's relationship with a product does not begin formally until after she makes an acquisition. There may have been market research to determine consumer preferences in color, style, size, or other attributes, but there is usually very little consumer involvement in directly shaping the design of the product. This lack of interaction between producer and consumer can lead to a rejection of the product and wasting of resources that went into marketing the product. This problem had to be avoided if the filters designed to prevent guineaworm were to achieve their objective.

A forum was needed in Idere where meaningful community input in filter design could occur. In October 1983, the PHWs had formed an association which was geared to helping them acquire basic resources to do their job, provide them with continuing education and give them a basis for joint action to solve community health problems. With over thirty active members from all sections

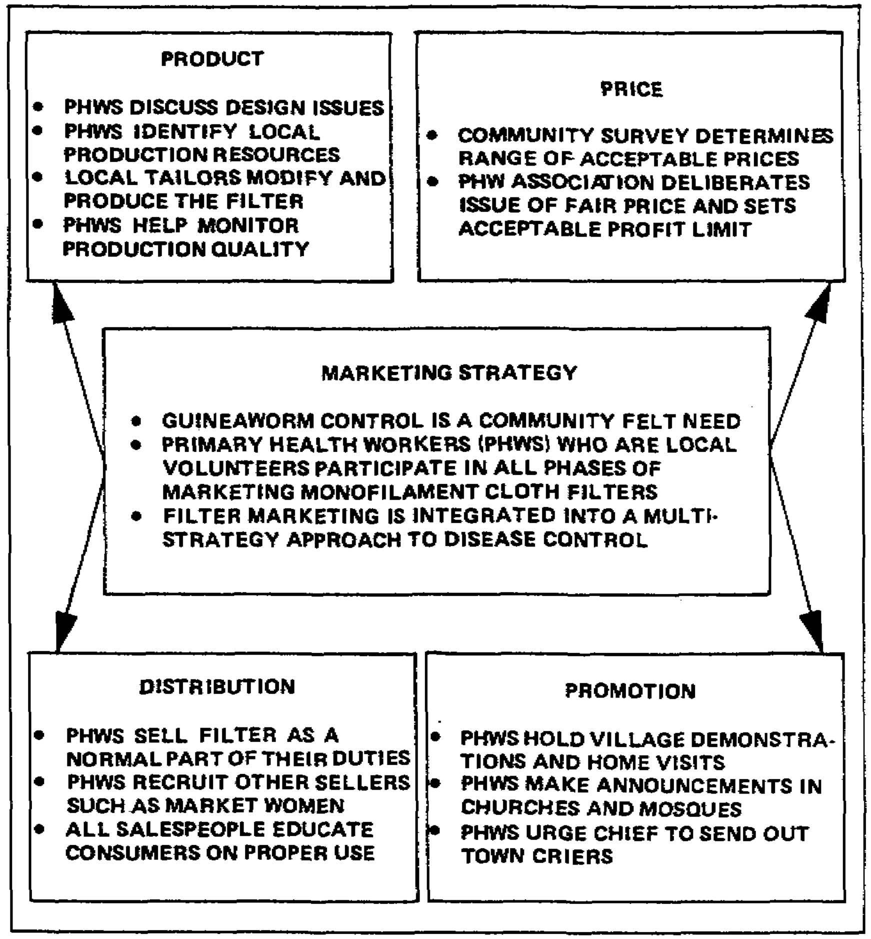

Figure 1. Community involvement in social marketing of monofilament nylon cloth water filters for guineaworm control in Idere, Nigeria.

of the town and hamlets, the association seemed the likely vehicle for fostering community involvement in this aspect of guineaworm control.

At its first formal meeting the PHW Association began to tackle the issue of guineaworm control. The options of both wells and filters were discussed. The former became the focus of long-term fundraising. The latter was slated for immediate action. With guidance from the health education team from ARHEC, the PHWs began to consider ways to design and produce a filter. One idea proposed was the insertion of white cloth into the wooden frames used locally to sieve flour. If the idea was found feasible, the association could sponsor production and sale.

Investigations eventually revealed that the filter idea could not be implemented easily. Wooden framed sieves were found to be uncommon locally as metal and plastic ones, made commercially in the city had now flooded the market. Because these were welded or molded in one piece, they could not be adapted for use as filters. The few remaining people who said they could make the old style sieve estimated the cost with cloth at around $3.00 each. This was found to be a minimum price because drinking water pots come in a variety of sizes. Although the PHWs agreed that the design would certainly be convenient to use, the cost factor caused them to shelve the idea for the meantime. Still a few PHWs went ahead and had wooden framed filters constructed for their personal use.

The TDR program was aware of the concerns and aims of the Idere PHWs since it had sponsored the bulk of their training to learn more about the potentials for guineaworm control in the context of primary health care. The studies on cyclops mentioned earlier were also sponsored by TDR, which fostered a link between the two projects. In April 1984, TDR sent a consultant microbiologist with his monofilament nylon gauze to Idere. Together with the health education team he examined local drinking pots, visited local tailors, toured the local market and studied samples of local pond water to determine cyclops species. At the conclusion of his visit a prototype design for a monofilament filter was developed [7].

The key element in the design was a rubber band, actually strips of old inner tubes commonly sold in the local market for sling shots. These sold for about fifty cents each, but could be purchased more cheaply in bulk. Cloth was cut in circles and the rubber band was sewn into the edge/hem. This was not only cheaper than using a wooden frame, but also fit more securely on the pot so that unfiltered water could not spill in by mistake. The PHWs were impressed with the design modification. TDR then decided to supply a small quantity of the monofilament cloth for experimental production, marketing and use in Idere.

Prior to the arrival of the cloth, the health education team, aided by locally recruited field assistants, surveyed Idere's main town and farm hamlets to determine the acceptability of the new filter. Interviews focused on women whose traditional domestic duties include water collection and possible treatment. Of the 371 interviewed, 56 percent had heard of filtering as a means of preventing guineaworm, but only 10 percent said that they practiced it. When shown a prototype of the new filter, all but three women said they would be willing to buy one. A specific price was mentioned by 63 percent of women which ranged from fifty cents to ten dollars per filter. An average price was three dollars and ten cents, and the median was two dollars. Of those who mentioned a price, 75 percent said they would pay at least two dollars.

Price was not the only survey consideration. As noted pots come in different sizes. The largest had a mouth of twenty-four inches while the smallest was only

six inches. The most common sizes of the 564 pots measured were fourteen inches (12.6%), fifteen inches (31.7%), sixteen inches (28.0%), and seventeen inches (14.0%). Smaller pots accounted for 7.2 percent while 6.5 percent were larger. With this information it was decided to make filters in three sizes—small (less than thirteen inches diameter), medium (13-16 inches) and large (more than sixteen inches in diameter).

When the cloth arrived in Idere in August 1985, the PHWs were immediately involved in the production process. One PHW was also chairman of the Idere Young Tailors Association. The PHWs naturally requested that he be responsible for arranging a group of tailors to commence local production. Besides himself, who served as supervisor, he selected three other tailors, two men and a woman. They all agreed to pool their efforts and brought the work to the woman tailor's shop which became the filter factory for the next month. The tailors advised the ARHEC staff to buy the rubber bands in bulk in Ibadan, the state capital, after which production began.

The tailors used their initative to develop production methods. First they tried sewing the hem of the circles of cloth, then inserting the rubber bands, much as they do when making local trousers or skirts which have rope belts. Pulling the rubber against the nylon was found to be quite troublesome, so they began sewing the band directly into the filter. They also discovered that by setting their machines on zig-zag stitch the product would be stronger than if straight stitches were used. The health educators and PHW leaders came to observe production regularly and check for quality.

Production also had to take into consideration factors which would aid correct use. A research assistant working with the project was able to document that cyclops could survive in a damp filter overnight. If the user inadvertently reversed the filter when pouring water the next morning, these surviving cyclops would be washed into the drinking pot. To alleviate this problem it was decided that the tailors would sew with a black thread on top and a white one on the bottom, thereby making a visible distinction.

A series of ten steps for safe and correct filter use were developed. First the side with the black thread would always be placed upwards on the pot. The middle of the filter should sag so that water would not splash out. Water should be poured slowly for the same reason. All water should be allowed to drain through the filter to avoid contamination during removal. The filter should be removed carefully so that all debris and cyclops on the top side will not be flipped into the water pot.

Users were advised to wash the filter after use, shake it out thoroughly and dry it outside in the sun. To protect the filter it should be stored away from sharp objects. Ideally the dried filter could be kept in a small nylon bag. Finally, users were encouraged to inspect the filter for tears or holes before each use.

Price Setting

In the commercial sense marketing is said to contribute 50 percent to the value of a product [10]. Social marketing also adds value to the good, service or idea by increasing its accessibility to consumers, but to achieve social goals, the amount of marketing cost passed on to consumers must be carefully considered.

For the guineaworm filters the basic input costs were as follows. Rubber bands bought in bulk cost eighteen-cents, which included a small wastage factor as not all bands were cut uniformly. Thin ones had to be discarded. The tailors agreed on a per filter sewing cost of forty-cents which included supply of thread. Adding price of cloth and estimated transportation costs, base prices were set at a dollar twenty-five for small, a dollar fifty for medium and two dollars and fifty cents for large.

TDR, the funding source, had stressed the need to set a reasonable price that would test people's willingness to acquire filters but not inhibit acquisition. Based on this, additional cost issues such as staff time and transport for promotion and supervision of distribution and sales were not included. In the spirit of social marketing, the sponsoring agency was assumed to be bearing the brunt of marketing costs.

Plans were made for community members to serve as individual salespeople. As incentive, a small amount would be added to the basic cost of filters and retained by the salesperson. It was envisioned that PHWs would be highly involved in the sales because of their past experience and knowledge in guineaworm control. Other salespeople could include local market women. Since PHWs in their association function much as a health committee to the community, the issue of a fair return for salespeople was brought to them for deliberation.

The PHWs were very keen that the project not turn into a moneymaking exercise so that the majority of townspeople could benefit. The health educators suggested that a reasonable profit range be proposed to sellers, but the PHWs felt that price differences (for the same size filter) would generate ill feelings in the community and sabotage the program. Therefore they unanimously agreed that profit should be fixed at twenty cents per filter.

Distribution Arrangements

The Idere community consists of distinct sectors. As noted there is the main town and the fifty farm hamlets. The hamlets themselves are grouped in two main clusters. One group, located northeast of town has easy access to Idere either by foot or vehicle as the farthest hamlet is only twelve kilometers away. The other cluster is west of town across the Ofiki River. This sector is nearly cut off from town when the river runs full from approximately May through December. The only access is a bridge located twenty-five kilometers north of Idere. The need to extend coverage to all three areas was considered.

PHWs have been found effective in social marketing for nutrition [13] and family planning [14]. They are members of the community and have a dedication to improve the welfare of their co-villagers. In Idere, PHWs have been actively involved in guineaworm control for many years [11], so that distribution and sale of filters would fit naturally into their usual work. Most of the active PHWs were found in the main town and the northeast cluster of villages. Therefore it was expected that PHWs would form the core of salespeople in these areas.

Considering the relative size of the main town and the underserved nature of the western sector of villages, efforts were made to recruit other sellers. This would add another dimension to the marketing process as it would be possible to compare the work of local business people with the volunteer PHWs.

The final sales force consisted of thirty-five individuals, twenty-seven of whom were PHWs. Seven other townspeople agreed to sell including four women who sell provisions in the local markets, a tailor, a shoemaker and a farmer/preacher. The thirty-fifth salesman was actually the project's field assistant. His original task was to monitor purchase and use, but when it was found that several of the villages had no easy access to a salesperson, it was decided to equip the field assistant with a supply of filters for direct sales.

All salespeople received training before being given their initial stock of twelve filters. The purpose and correct use of the filter were explained and demonstrated. Salespeople were reminded that health education was their major task, for if people did not use the filters regularly and correctly, the disease would not be prevented and people would be dissatisfied with the product. In particular salespeople were told that due to the long period the worm takes to develop (an average of twelve months), some customers may already be infected with the disease. These should be told that full benefits may not be seen for a year or more and only if constant use is made of safe, filtered drinking water.

Arrangements were made so that salespeople could receive additional stock easily. One of the PHWs volunteered to keep extra supplies in her home. Also the health education team brought filters with them to the fortnightly PHW meetings for those who needed more. It was also during this meeting that PHWs submitted their receipts. The field assistant was responsible for collections from non-PHW salespeople and from those PHWs who lived far from town and did not attend regularly.

Sales Promotion

The duty for promoting community awareness and encouraging sales was placed with the PHW Association. They called village and compound meetings where the filters were demonstrated. They also made house-to-house visits to explain and show the product. At the association meeting members were designated to make announcements at the local churches and mosques. The PHW leaders visited the King of Idere to explain the project. He agreed to have his town criers make announcements about the filters.

The field assistant made monthly visits to villages and compounds to document sales and monitor use. He used these visits not only to promote sales but also to reinforce education about regular and correct use of the filters. He also checked with the PHWs to learn of their problems in promoting sales and offer solutions.

MARKETING OUTCOME

Sales began in October 1985, at the beginning of the dry season just before guineaworm transmission would start. During the next six months 407 filters were sold, 74 percent by the PHWs, 5.4 percent by the other salespeople, and 20.6 percent by the field assistant.

A sample of 779 households were monitored in both town and hamlets. Among these 32.6 percent had purchased a filter. This compares favorably to another product-oriented program, contraceptive social marketing, where activities in ten countries ranged from 0.4 percent to 15.3 percent of married women of reproductive age served or from 1.1 percent to 40.5 percent of current contraceptive users served [15].

The value of PHW and community involvement was demonstrated. Table 1 shows that in both villages and towns where the resident PHW had obtained filters to sell, coverage was highest. Even in locations where the resident PHW did not have filters, sales were higher than in other villages/compounds. As can be seen in locations with no PHW or with other resident salespeople, coverage was lowest.

The salespeople did perform their educational duties as 95 percent of sampled buyers reported that the seller both explained and demonstrated the proper use of the filters before sale. Of the ten points required for correct and safe use,

Table 1. Presence of PHW and Filter Sales in Idere Town and Hamlets

Households Possessing Filters	*Hamlets and Extended Family Compounds*				
	PHW Has Filter	*PHW Has No Filter*	*Other Seller*	*No PHW*	*Total*
Yes	149 (42.2%)	54 (33.3%)	15 (18.5%)	36 (19.6%)	254
No	204	108	66	147	525
Total	353	162	81	183	779

$\chi^2 = 36.101$, $d.f. = 3$, $p < 0.0005$

buyers rememberd an average of 7.6 items. Even among the 525 households that did not buy filters, 93 percent were aware of the product and all but four of these knew it was designed to prevent guineaworm.

Total sales surpassed $700. In the context of a multi-strategy approach to guineaworm control, this money was donated by the project to the PHW Association's well fund. This provided nearly a fourth of the money used to dig two community wells which were completed in April 1986. This act also linked social marketing to the broader social issue of adequate and reliable water supply.

CONCLUSIONS

Not only is it possible to involve a community in all aspects of social marketing, but involvement pays dividends in terms of product usefulness and acceptability. This emphasizes the importance of meaningful interaction between producer and consumer of social products, an interaction which health educators have a duty to foster.

Concerning product design, the fact that the PHWs had given thoughtful consideration to the issue of filters made them receptive when a better technology came along. Their involvement in the production process gave them a deeper understanding of the product, making them better promoters and salespeople. The filter also heightened the PHWs' commitment to and feeling of competence in their overall health care duties by providing them a tangible contribution which they could make to community health. The PHWs' strong sense of involvement and ownership of the project even went as far as to override the researchers' interest in the possible effects of variable pricing.

Local involvement in actual production is a key element in developing an appropriate technology [16]. This has the benefits of reducing costs by using local resources and abilities, increasing local problem-solving capabilities and product acceptance, and even holds the possibility of providing local people with additional revenue. The Idere tailors in short, were in the best position to produce a filter that was most suited to their own environment.

The PHWs as community volunteers proved their value as salespeople, by selling on average over three times as many filters apiece than did the seven "commercial" salespeople. The sales by the field assistant were concentrated primarily in areas where no PHWs were present and were facilitated by his having regular motorcycle transportation. In future consideration could be given to how to facilitate PHW mobility beyond their own hamlets to provide health services to a wider area.

The PHWs had a clear motivation to sell, and some did not even collect the extra twenty cents to which they were entitled. In contrast the commercial sellers stocked filters among many other items which competed for their attention, items which would be open to the market forces of bargaining and thereby more likely to bring a greater profit. One might suppose that involvement by the PHWs not only gave greater access for consumers to the product but also guaranteed it would be available at a reasonable price because of the PHWs' basic value orientation toward community service.

Overall sales for a first time effort were impressive. The positive community response could be linked to the fact that guineaworm control efforts had been underway for some years in Idere and that these efforts themselves were organized in response to a community felt need. The current approach to social marketing is generating a demand for a product or service [17], but from the health education point of view, the practical and ethical concern of responding to the client's self-perceived needs still holds much value, as can be seen in Idere.

Aside from generating sales, the project also increased community awareness, but awareness does not necessarily lead to acquisition. The diffusion process may continue if filters are placed on sale for another guineaworm season, but resistance will naturally continue. There are indications of cultural, economic, and social variables that inhibit sales (and will be explored in a future paper). The presence of such variables again reinforces the need for multiple strategies in community health education programs.

In conclusion, social marketing is a neutral tool for social change as are many others Advocacy can be educational if the client is encouraged to speak out for himself. Behavior modification can be educational if the patient helps develop her own treatment plan. Social marketing becomes educational when the community is involved in all stages of the marketing process, including determination of what are the basic health needs which marketing should address.

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SELECTING ALTERNATIVE STRATEGIES FOR COMMUNITY HEALTH EDUCATION IN GUINEAWORM CONTROL*

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ABSTRACT

Community health education strategies in guineaworm control can be applied at several intervention levels. Community development mobilizes local resources to provide safe water supplies such as wells. Mass education in schools and communities can teach personal protection measures such as filtering water. Training of volunteer community health workers produces front line staff, who by being culturally in tune with the community can demonstrate and promote the use of appropriate prevention and treatment measures. Advocacy assists community members to express their needs to government and ministry decision makers. All of these strategies have been applied in a community health education/primary health care program in Idere, Ibarapa District, Oyo State. Community development for well construction was found to be a long-term strategy that first must overcome problems of village organization and resource location. Mass education, to be effective, must have a simple and acceptable technology to promote. Trained village health workers must overcome traditional beliefs that inhibit use of preventive and treatment measures. Advocacy requires basic political education of community leaders. A variety of health education strategies is needed to address short- and long-term priorities as well as to overcome the different barriers to guineaworm control.

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INTRODUCTION

Health education in guineaworm control focuses on the human behavioral aspect of disease transmission. In the case of guineaworm these behaviors are quite simple:

1. drinking water which contains infected cyclops, and
2. wading in water by persons with active guineaworm ulcers.

Health education aims at encouraging as well as enabling people to change these behaviors. This goes beyond providing basic information to include helping people acquire the resources, appropriate technology, skills, social organization, and political support that make change possible.

Community health education for guineaworm control has been under way in the town of Idere, Ibarapa District, Oyo State, Nigeria since 1978 [1, 2]. Six years experience in this small community of 10,000 has yielded valuable insights into the appropriateness and applicability of various educational strategies for disease control.

NATURE OF THE DISEASE

Guineaworm (*Dracunculus medinensis*) is a water-borne helminthic disease endemic in Africa and South Asia. The adult female worm is usually found in the subcutaneous tissue of the lower limbs of its host where it can easily protrude and expell its larvae into ponds when the host fetches water, wades, or bathes. The guineaworm larvae are swallowed by a small crustacean of the cyclops species and mature into an infective stage after fourteen days. When the cyclops are consumed in drinking water, they are digested releasing the guineaworm larvae which penetrate the stomach wall. As the worms grow eventually reaching one meter in length, they migrate to subcutaneous tissues. Nine to twelve months later they will produce an ulcer on the skin, emerge and renew the cycle by depositing their own larvae in a water source.

BACKGROUND TO INTERVENTION

The Idere program is admittedly a small-scale operation relying on community self-help and local resources. A vertical disease-oriented program was avoided. Instead guineaworm was viewed as one of many local concerns which would be addressed within the context of a community-based primary health care program. The community-oriented approach offers greater latitude for consumer involvement in providing health care. At the same time there are recognized limitations on what can be achieved through self-help.

The persistent presence of guineaworm in Idere is as much a social, cultural, and geographical problem as it is a biological and medical one. Guineaworm was virtually eliminated in the neighboring town of Igbo-Ora in the late 1960's when pipeborne water was provided. Idere began to follow the same trend when the pipes were extended to the town in the early 1970's.

Unfortunately the water system was never fully able to cope with the additional burden. This combined with equipment failure and pipes damaged by road construction meant that Idere residents came to have only intermittent water supply by the late 1970's. In fact, due to low water pressure, piped water only reached the eastern one-third of the town.

Theoretically if guineaworm had been eliminated during the years of adequate water service, a return to local pond water after the taps had dried would not have brought resurgence of the disease. Unfortunately the prevalence of guineaworm during the 1980/81 dry season reached nearly 40 percent. The potential for reinfection had always existed due to the social and geographical structure of the community [3].

Like most towns in the area, Idere is not a single unit with a stable population. There is a main town of 8,000 residents and fifty scattered farm hamlets containing the remaining 20 percent of the population. Farm residents hail from the eighty different family compounds in the main town. Visiting between farm and compound is a common weekend and holiday activity. Since pipewater was never extended to the hamlets, these served as constant reservoirs of guineaworm infection. Community health education therefore had to address this phenomenon with both village and town-based programs.

ALTERNATIVE STRATEGIES

Effective guineaworm control relies on a number of strategies including provision of safe water, health education, treatment of existing water sources and treatment of infected individuals, and in the same context, the health education component of control must adopt alternative strategies in each local circumstance [4]. Four interrelated community health education strategies were employed in varying degrees in the different localities of Idere:

1. *Community Organization* aimed at mobilizing local resources to provide safe water supply (wells) at the village and compound levels;
2. *Mass Education* through community meetings and school health activities promoted the use of simple technologies (filtering) as short-term protective measures;
3. *Training* of primary health care workers (PHW's) provided front line volunteer staff who could communicate new ideas in a culturally acceptable way, serve as a vanguard in community mobilization and provide simple treatment; and
4. *Advocacy* addressed the need for reactivating the pipe-borne water system and other areas of government responsibility.

During the pilot phase of the Idere program ten hamlets and five compounds became self-selected participants. In each a volunteer PHW was trained. In 1983 the program was expanded with funds from the Special Programme on Research and Training in Tropical Diseases, WHO/World Bank/UNDP, to include a total of twenty-seven hamlets and eighteen compounds.

COMMUNITY ORGANIZATION IN VILLAGES

Community organization in the hamlets got off to a good start in the early phase of the program with six of the ten pilot villages constructing wells. Unfortunately technical problems arose. A combination of sandy or clay soil conditions and lack of sturdy construction design resulted in four collapsed wells. Two wells did not yield adequately due to poor siting.

Problems during the pilot phase taught health education staff to link with hydrologists and engineers for more effective program expansion. One result was location of ideal well sites in all participating villages. A second was the introduction of cement ring technology to prevent well collapse. Still by 1984 only four new wells had been constructed. None used the new ring technology. The reasons for slow response to community organization were several.

From the beginning the program had been offered to all fifty hamlets, but only ten volunteered initially. Of these, six went ahead to construct wells. These six were the innovators. One would naturally expect an increase in participation if the innovation was easy to adopt, but a well is not a simple artifact [5]. Financial, organizational, social, and access factors slowed the pace of community development.

On the financial level, the improved well was estimated to *cost* $2,500, ten times the amount of a traditional hand-dug well. That in itself meant extended fund raising time. On top of that, economic recession and two extremely dry years had severely dented farmers' cash income.

Community organization requires *cooperation* among villagers. It was discovered that in most hamlets there was little history of large-scale community projects. Residents normally came from different family compounds in Idere and even from other towns in Ibarapa. Their allegiance is vested not with the hamlet but with the extended family where regular contribution to self-help is quite common. The very labor intensive activity of regular follow-up meetings in each hamlet is needed to build trust among villagers, a process that may take a year or more to yield results.

The question of *social value* also arose. Even though a farmer may spend most of his time in the hamlet he still views it as a temporary residence. Someone living on the farm for twenty years may still occupy a small one-room mud hut with thatch roof. Major financial investments are made in the family house in Idere, rarely in the hamlet.

Assuming someone wanted to apply the cement ring technology to well construction, he would have difficulty gaining access to skilled workers. The nearest firm that produces well rings is in Ibadan, the state capital located 120 km to the east. Efforts are underway to transfer ring-making skill and technology to local well diggers and construction companies.

One concludes that guineaworm control based on self-help in the farm hamlets is a very long-term process, especially when one considers the scarce financial resources and lack of social cohesion. The need for external resources becomes glaring.

Mobilization in Town

Community mobilization in town took a different form. After the taps became dry, water was recognized as a priority community need. Ironically, local attitudes put the responsibility on government to solve the problem. Although water supply was unreliable by 1978, there were only ten wells in all of Idere town (three of which had been constructed by the local government). Eventually residents began to realize that government intervention in water supply was not forthcoming. After a time lag of five or six years, well construction by family compounds began in earnest. By November 1983, there were sixty-seven wells in town.

Idere is nestled between huge granite inselbergs rendering much of the town unsuitable for year-round wells. Two-thirds of the wells dry up during the season of maximum guineaworm transmission. Since not all compounds are located ideally for wells, the solution from a community viewpoint seemed to be a series of correctly sited and strategically placed community wells. This requires community organization beyond the level of the individual compound.

The number of active PHWs in Idere town has reached a critical mass of 25. They have organized an association among themselves and have developed the confidence and will to reach out and mobilize the larger community. As of now the PHW Association is conducting fund raising for the construction of four community wells.

Two factors make the success of community organization more certain and swift in the main town. First is the existence of a core of knowledgeable and dedicated residents, the PHWs. The fact that they are several provides the social support needed to build momentum for community change. Secondly, the town contains a greater concentration of human and financial resources which can be mobilized for the public good. The lone PHW in a small isolated hamlet lacks these advantages.

Mass Education

The purpose of mass education, also known as social marketing, is to make accessible and acceptable simple health ideas and technologies [6]. In the case of guineaworm control, the simple idea and technology is in the form of a short-term solution such as water filtration. This simple concept, which can be promoted through the media, schools, and public meetings, should be easy for the individual to adopt.

At the beginning of the Idere program, no specific filter existed. The idea promoted was simply using a clean square of white cloth held over a pot of water. Though this was not expensive, it was awkward to use. Later the idea was developed to put the cloth in the frame of a local wooden flour sieve. This did not succeed for two reasons. First, locally-made sieves were rare and quickly being replaced by manufactured metal ones. The new sieves would not only rust but were too small for traditional clay water pot mouths. Secondly, cloth tacked onto the sieve frame would be difficult to clean.

Fortunately another WHO Tropical Disease Research project in Burkina Faso (Upper Volta) has identified a nylon/polyester monfilament gauze that not only reliably removes infected cyclops, but is easy to clean [7, 9]. The cloth is durable, and when a piece has a rubber or elastic band sewn around its edge, it can easily be put over pots as a filter. Plans are under way to produce and promote these gauze filters through the Idere PHW Association, local schools, and markets.

Primary Health Worker Training

The Idere program trained 110 volunteer PHWs from both villages and town. Some PHWs were selected by their co-villagers and others volunteered out of self-interest. Follow-up supervision has shown the community-selected PHWs have been more active in mobilizing community funds for village drug kits, providing health information, and treating the sick.

Town-based PHWs, as has been noted, are experiencing success in organizing the community. Village-based workers on the other hand, have been influential in disseminating health information. The town has many sources of health communication—the schools, local clinics, public meetings. Therefore awareness and reported use of filter cloth is about equal in compounds where PHWs do and do not reside.

In the villages, however, the PHW is the main channel of health communication. Awareness of filtering as a guineaworm preventive measure is as high as 64 percent in the villages with PHWs compared to 26 percent with those without. Reported use of filters was 12 percent in villages with PHWs, while none claimed filter use in non-PHW hamlets. Thanks to the PHWs, a strong potential market for the new nylon/polyester gauze filters exists.

Follow-up supervisory visits to PHW villages reveal that a transition between traditional and modern beliefs is taking place. Previously people believed guineaworm is "in the blood" of all Idere people and only emerges when the blood is weak. Now it is rare to find someone who does not say guineaworm is caused by bad water. Some may clarify further and say they still believe guineaworm is in the blood, but it is the bad water that makes the blood weak, which then brings out the worm.

PHWs have been effective in the area of treating common ailments. They use chloroquine, tepid sponging, oral rehydration therapy, and bandage cuts and wounds. They have been taught to dress guineaworm ulcers for preventing disabling secondary infection and as a way of reducing host-water contact, one element of disease prevention [9]. Dressing ulcers has not been popularly received as Idere people believed that if the guineaworm is covered, it will start fighting until it can find an outlet.

It should be noted that the PHWs are part of a university health project and not formally linked with government health services, though this link has been tried unsuccessfully on several occasions. The PHWs can be more successful when they have reliable access to outside resources such as filters, medicines, and community development funds through governmental and other agencies.

Advocacy

Political advocacy was deemed an appropriate strategy for resuscitating the dysfunctional pipe-borne water system. Health education staff consulted with community leaders to prepare them for discussion with officials from the Ministry of Health and the State Water Corporation. Visits were conducted to the State secretariat, the local water works, and the homes of important ministry and political officials. Field visits by ministry officials were used as occasion for Idere leaders to express grievances.

This activity yielded many promises but few results. As a temporary help the Water Corporation acquired an extra tanker to convey water to Idere, but misunderstanding developed. The community thought that daily supply of free water would commence, and the Water Corporation patiently waited for requests accompanied by a fee of $25 per tanker. When the issue was clarified, the community balked at the idea of fees since previously they could get free water from the taps and now could fetch it freely from the ponds.

It became evident that Idere leaders lacked sophistication in the modern political process. They were not adept at the follow through needed to secure results. Being small and poor Idere also lacked an important route of political access, the well placed local son or daughter who could bargain for influence among ministry and political colleagues. Finally changes in government in recent years have made Idere leaders wary of sticking their necks out, even if it is for something as basic as water supply.

CONCLUSION

The prevalence of guineaworm in Idere's main town has shown a steady drop in five years of monitoring from a high of 42 percent in the 1980-81 dry season to 21 percent in 1984-85. The contribution of family well construction has likely played a substantial role in achieving this reduction of disease.

A variety of health education strategies are needed to enable people to prevent guineaworm. The effectiveness and appropriateness of a particular strategy depends on given social, economic, and political realities. Even a small community like Idere may have distinct divisions (i.e., town and hamlet) which require differential application of strategies.

Community organization was found to work best where adequate human and financial resources were concentrated. Mass education relies on the presence of a specific, simple technology which can be easily adopted and used. Primary health workers are an important channel of health communication in isolated rural villages. Finally political advocacy cannot succeed unless preceded by a long process of political education.

With a proper mix of health education strategies, rural communities like Idere can go a long way in controlling diseases like guineaworm, but self-help does not provide all the answers. Appropriate, adequate and timely infusion of external resources is still needed to compliment local initiative and to tip the balance in favor of community health.

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Guineaworm, Maternal Morbidity, and Child Health

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Summary

Studies have documented the effect of guineaworm concerning days lost to agricultural work and drops in school attendance, but little is known about how the disease disables mothers and impairs their ability to care for their children and families. A pilot case study of 42 women in two rural Nigerian communities has been conducted to fill that gap. Guineaworm was responsible for half of child immunization defaulting and deterred women from using maternity services. Guineaworm kept women from their jobs and trades, costing an average of approximately $50 in lost income, a sizable chunk of a family's support considering the annual *per capita* income for the area is just over $100. Other problems experienced included loss of appetite and reduced food intake, unattended child illnesses, and disabling secondary infections resulting from unhygienic self-treatment. The ill women and her dependent children put great strain on the support network of family friends, a network already weakened in many cases when several other members were also afflicted with guineaworm. While further research is needed to learn more about this disabling disease, there is no excuse not to implement known guineaworm control interventions. The experience with mothers and children in Nigeria has shown that guineaworm control through water supply improvement should be a major child survival and development initiative.

Introduction

Aside from the very obvious pain and suffering caused by a 1-m long helminth emerging from an ulcer on the skin, the major impact of guineaworm is economic.[1] Estimates are that 40 per cent of those afflicted are completely disabled for well over a month, with the number of worms determining the length of disease-imposed inactivity.[2,3] Literature documenting the exact nature and extent of this problem is limited.[1]

Available studies on guineaworm impact do not paint a complete picture, but have focused mainly on days lost to agricultural production.[3,4] Some work has also been done on the effects of guineaworm in school attendance.[5,6] The domestic sphere has received little or no attention. This raises the question of what happens to a mother, especially one with small children, when she is attacked by guineaworm? The answer has far reaching consequences because in Africa, where most guineaworm cases are now found, women not only bear the responsibility for all domestic duties (child care, cooking, fetching water, etc.), but also are major actors in the economic arena.[7] This pilot study in Nigeria strives toward some answers.

Acknowledgements

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Materials and Methods

Two guineaworm endemic areas in Nigeria were chosen for study. In both the Yoruba ethnic group predominates. One site is Idere town, a tightly clustered settlement of 8000 people nestling among huge granite inselbergs in the western part of Oyo State. Tap water which was installed in the community in 1968 became irregular in the late 1970s resulting in a resurgence of guineaworm. Dry season (October–March) prevalence of the disease during 1987–88, the period of study, is estimated at 30 per cent.

The second site consists of seven rural villages in the Asa and Moro Local Governments of Kwara State, with an estimated guineaworm prevalence of 60 per cent during the study period. These settlements with an average of 250–300 residents are located in the south central part of the state. Both sites are primarily agricultural communities. Women are engaged in farming, petty trading, and local crafts. Idere has access to modern health care through a government maternity centre/dispensary, while the more isolated Asa-Moro villages do not.

The target population is pregnant women and mothers of children aged 0–24 months. This is the focal age group of the current Expanded Programme of Immunization in Nigeria. The study looked specifically at women who were actually suffering from guineaworm during the 1987–88 dry season. Community leaders and volunteer primary health workers helped identify 21 women who met the above criteria for interview at each site.

An in-depth interview/case study approach was employed using an interview and observation guide. The guide was developed from the results of two focus group discussions held in the field with women in the target group. The experiences of these women pointed to the need to study six key variables:

1. the nature of illness and disability during a guineaworm episode;
2. the ability of women to carry out normal household duties during this illness;
3. the extent to which child care responsibilities could be handled;
4. the women's capability to continue work/economic pursuits;
5. the amount and type of self-care the women could provide;
6. the availability of social support to carry out any of the above for women afflicted with guineaworm.

Interviews were conducted between December 1987 and January 1988. Each interview was developed into a case study. The case studies were reviewed to identify trends and summarize findings. The case study method allowed the researchers to develop a more human and qualitative perspective on the problem.

Results

Disbility resulting from pain and secondary infection of the guineaworm ulcers tended to be severe in the 42 women studied. Over one-third (38 per cent) were bedridden at some time during their illness. Twelve (29 per cent) could barely hobble with the aid of a stick. Nine could limp unaided and five could walk normally (two of these were affected only on their hand/arm).

Each woman had an average of three guineaworm ulcers, most of which appeared on the lower limbs below the knee (77 per cent). It was noticed that the guineaworm ulcers often appear in succession, thereby extending the period of suffering. Up to the time of interview, each woman had been afflicted for at least 1 week with a maximum of 18 weeks and an average of 10.

Home duties

The case study approach made it evident that there are two broad categories of domestic duties, those that can be performed at home (cooking, washing, sweeping) and those that require moving beyond the home (marketing, fetching firewood, collecting water). Only two women were able to perform all domestic duties throughout their bout with guineaworm. Ten were confined to home-based chores only, while the rest (71 per cent) needed help with all chores.

As described by the women, the discomfort of the disease made it difficult to perform sustained activity. Sitting on the typical small stool in front of a cooking fire was particularly painful. Sufferers preferred to sit on a mat at the front of the house with legs outstretched.

Self-care

Women found it equally difficult to take care of their own basic needs and were frustrated by the experience. Six had trouble moving out of the house to defaecate and had to use a pot. Those who could hobble or crawl to the nearby bush to relieve themselves said they reduced their food intake in an effort to decrease frequency of defaecation. Reduced eating had other causes as the smell of the guineaworm ulcer was nauseating. Lack of activity also depressed the appetite. Deteriorating financial resources, as noted below, was another detriment to eating.

Bathing proved difficult for 29 per cent of the women and several (19 per cent) looked dirty and unkempt. Shortage of water in the dry season combined with the guineaworm disability made bathing a rare luxury even for those who could stand.

An open guineaworm ulcer is the route for disabling secondary infection. Self-treatment by most women involved rubbing various oils (palm, shea butter, palm kernel) or oil mixed with herbs on the site. Only 14 per cent did nothing to care for their ulcers. Few (24 per cent) covered the ulcers using cotton swabs, boiled leaves, or bandages. Four sprinkled the contents of antibiotic capsules on the sores. In one Kwara village, interviewers documented the practice of punching the swollen area with a red hot iron just before the worm was ready to emerge as a means of 'relieving pressure'.

Care during pregnancy was reported by four Idere women who gave birth during the study period. Only one attended some antenatal care. Two who could not attend blamed guineaworm. Subsequently, none delivered at the maternity centre. One clearly could not move because of a painful guineaworm ulcer on her buttocks. It should be noted that since the local government began charging fees in 1984, attendance at antenatal care and deliveries have reduced by half, so that guineaworm is not the only factor involved.

Economic activities

Few Yoruba women are solely housewives, and all but two women studied had a trade. A woman's income makes a major contribution to family welfare. All Asa/Moro women had a three-pronged economic pursuit—trading in farm produce, working on the family farm, and maintaining their own irrigated vegetable plots. In Idere three were farmers, fourteen were traders (agricultural products, provisions, cooked food), two were skilled (goldsmith, typist), and two recent high school graduates were unemployed.

Most (80 per cent) of the 40 who worked abandoned their occupation at some point during their guineaworm episode. A few traders were able to keep a shop open or sell wares in front of their house until stock ran out.

The financial loss for those who could estimate their income was substantial. Those involved in farming, especially if it was the family farm, had difficulty figuring their income and loss, but traders had a clearer idea of daily profits and losses. Among the 12 who could estimate income, daily earnings would normally range from ₦2 to ₦10 (which at the time of study equalled approximately $0.40 to $2). Total loss for these 12 women during their illness ranged from ₦60 to ₦800 with an average of ₦293. Average annual *per capita* income in the area is only ₦500.[8] The women interviewed had little in the way of savings, and this was rapidly used to feed themselves and their children.

Child care

Mothers fell into three categories regarding child care—those who could do everything for their baby (22 per cent), those who could only feed the child, but not bathe her, wash her clothes, nor cook her food (45 per cent), and those who were completely dependent on the help of others (33 per cent). Three major child care activities are examined more closely—feeding, care during illness, and immunization seeking.

All but two mothers were still breast feeding. Two had guineaworm on the breast. One stopped breast feeding while the other reduced, and in both cases the children noticeably lost weight. Six others decreased breast feeding because the throbbing ulcers made it painful to sit up or because guineaworm sores on hands or arms made it awkward to lift the baby. In summary breast feeding was disturbed for 20 per cent of children who were not yet weaned.

In terms of general nutrition, only 15 mothers reported that their children were eating normally. One case of frank malnutrition was found in the Kwara villages. In most cases mothers reported reducing their children's diet, just as they had decreased their own, due to financial constraints imposed by guineaworm.

Concerning illness, 12 of the children were sick 15 times during their mother's bout with guineaworm. Problems included fever (4), boils (3), diarrhoea (3), and one each of ear discharge, rashes, malnutrition, post-circumcision fever, and even a case of guineaworm in one 18-month-old child. Action taken included buying medicine from a shop (5), going to the maternity centre (2), traditional medicine (2), and no treatment (6). No mother used ORT for diarrhoea, two did nothing and one bought patent medicine. For fever two mothers bought chloroquine, the third purchased an unnamed drug, while the fourth did nothing. The child with guineaworm received traditional treatment.

Immunization clinic is available in Idere town and is held twice a month. Four Idere children were completely immunized before their mothers were attacked by guineaworm. Two other had begun immunization and were not yet late for the next contact. Four had never started and three defaulted before the illness. This leaves eight who could not begin immunization or who defaulted because of guineaworm-imposed immobility. This means that guineaworm was responsible for slightly over half of the defaulting or non-participation among these children.

Role of helpers

Most women received help from family and friends to cope with their needs and duties. In many cases this help was fragmentary for one of two reasons. In Idere it was often the situation that other members of the household were not at home for most of the day because of their farming and business activities. In most Asa/Moro homes and some in Idere, many other residents were immobilized by guineaworm greatly reducing the pool of available helpers.

Most assistance with chores and child care came from female friends and relatives, although there were instances of husbands collecting firewood, ironing clothes, and cooking, or younger brothers collecting water, washing clothes, and sweeping. Amount and type of helper varied by task. Sick mothers tried to do as much child care as possible and when they were unable, they entrusted the child mostly to a daughter, co-wife, sister, or their own mother. In contrast, much help was required for domestic duties, and was rendered by more distant relatives and older women living in the home. Only four women allowed others to help with their trading (their own children or nieces and nephews) while the rest abandoned economic activities until after recovery. Little help was received from outside the extended family, though close friends would run errands outside the home or play with the child to give the mother some rest and the baby some fresh air.

Help also had a financial dimension which was sometimes indirect as helpers would often forgo their own economic pursuits to provide assistance. Cash was given to 26 women mainly by their husbands with some help from their mothers and siblings. Yoruba husbands and wives usually keep their finances separate. In rare cases neighbours gave loans. Assistance in kind, particularly food, came from relatives, friends, and neighbours.

Six women could not find adequate help. Two of these moved out of their matrimonial homes to live with relatives, while the others spent most of the day lying on their mats inside the house while the baby cried until somebody would come home in the late evening.

Discussion

The case study method has provided an in depth look at the dynamics of disability caused by guineaworm. The thread of events leads from painful ulcers, decreased mobility, loss of income, reduced food intake, and lower levels of personal hygiene to despondency, and in some cases neglect. The threat of a mother's suffering entangles other lives as relatives spend extra time and cash on the sick person, and basic child care needs go unattended.

The problems documented herein arise from the multitude of difficulties that poor rural women face. Guineaworm is not the only reason for immunization defaulting, missed antenatal appointments, inappropriately treated child illness, or poor nutritional intake, but it exacerbates these problems and is itself one of the results of living in a disadvantaged environment.

As was intended, this pilot study raises many questions for further research. How will a woman recapitalize her lost savings and begin earning an income again after a bout with guineaworm? Will there be a longer term effect on the baby's nutrition and growth during the illness and recovery (both economic and health) period? Will missed immunizations be made up, or will the child succumb to a preventable disease first?

Clearly, further inquiry should not continue at the expense of these women's health. Proven interventions that have improved community water supply should continue in the area.[9] The guineaworm experience in Nigeria makes it obvious that safe and sufficient water is not only an economic or an environmental issue. It should also be a major component of any child survival and development programme.

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IMPACT OF GUINEA WORM DISEASE ON CHILDREN IN NIGERIA

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Abstract. School attendance records of all primary schools in a guinea worm-endemic village in southwestern Nigeria were examined to determine the cause of missed school days and school drop-outs. At the time of the survey, 1,495 pupils (768 boys and 727 girls) were registered in the 4 primary schools in the village, of which 21% of the pupils were infected with guinea worm disease (GWD). Female pupils had a higher infection rate than their male counterparts. Guinea worm-infected pupils missed up to 25% of school year days compared to a non-guinea worm-infected absence of 2.5%. At the height of guinea worm season in the study area, guinea worm-related absences contributed virtually all of the absenteeism recorded in the schools. Implications of the findings within the context of educational attainment of the pupils are discussed.

Guinea worm disease (GWD) is endemic in most rural communities in Nigeria. Efforts to control the infection in Ibarapa district of Oyo state have not been successful largely due to the paucity of sanitary water supply in the affected areas. Pipe-borne water supply to western Ibarapa district stops at the village of Idere, as a result, most villages in western Ibarapa depend on stagnant shallow ponds and wells for their domestic and main drinking water supply. These collections of surface water serve as breeding grounds for the *Cyclops* species, the intermediate obligatory host of *Dracunculus medinesis*, the causative organism of guinea worm infection.[1] Disability due to GWD may last for 3–4 months, depending on the location of guinea worm lesions and relative number of ulcers.[2,3] A high prevalence of GWD coincides with mid-school year activities and major agricultural activities when the farm lands are cleared manually in preparation for cultivation, planting and harvesting of the essential staple foods.

Although many workers have studied the impact of GWD in terms of lost work days and decreased agricultural productivity in the adult labor force, little is known of the effects of GWD on children's activities.[4,5] This study reports the findings of a cross-sectional survey of GWD among primary school children (aged 6–14 years) in Idere during the school year 1981–1982 and the impact of the disease on school attendance.

Accepted 16 April 1986.

MATERIALS AND METHODS

Study area

Idere is about 117 km southwest of Ibadan, the seat of Oyo state government, and about 5 km from the Rural Health Center Igbo-Ora. Domestic water supply for Idere residents comes mainly from shallow ponds. Cisterns for rain collection and stand pipes do provide some amount of water for the people. However, while on their farms, Idere farmers and their families collect their drinking water solely from shallow ponds which contain guinea worm-infected *Cyclops*. There are 4 primary schools in Idere. When not in school, most of the boys and some of the girls between the ages of 10–14 years help on the family farms.

Primary school visits

All primary schools were visited during the months of January and February of the 1981–1982 school year, the height of guinea worm season in Ibarapa. On the survey day, each pupil present in school was visually examined for a guinea worm lesion or blister and for a palpable pre-emergent adult guinea worm under the sub-

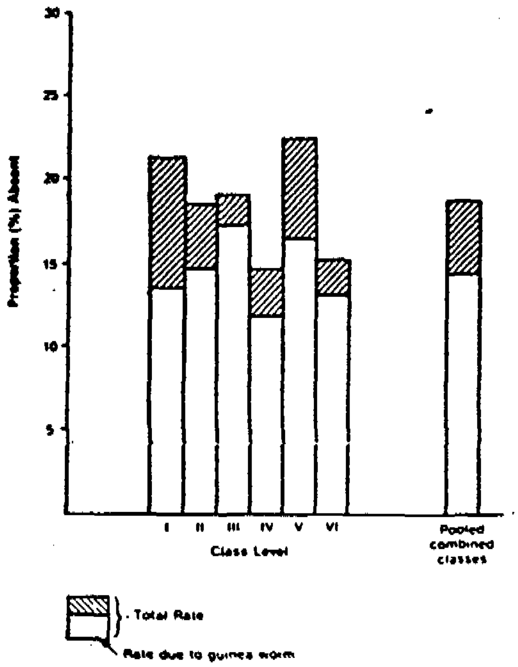

FIGURE 1. Distribution of rate of nonattendance in Idere schools by class level 1981–1982.

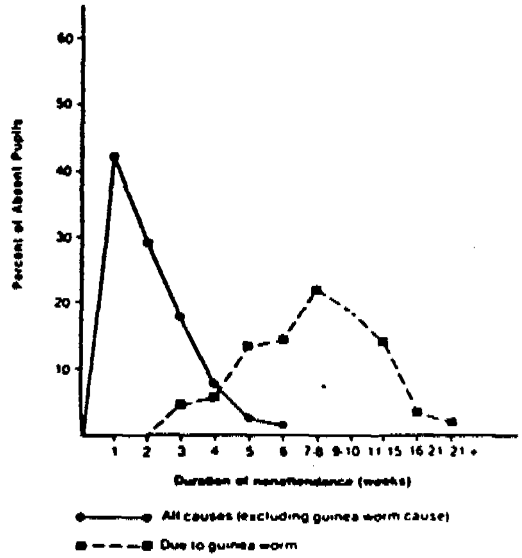

FIGURE 2. Comparison of percent duration of absenteeism (in weeks) in Idere primary schools by cause, 1980–1981.

cutaneous tissue. Attendance records of each class during the 1980–1981 and 1981–1982 school years were inspected for cause and duration of absences. Confirmation of cause for absence normally was obtained from the class teacher, but a relative of the pupil in the same school was consulted in cases of doubtful ascertainment of cause by the class teacher. Furthermore, class teachers and school headmasters were individually interviewed as to what proportion of their pupils dropped out of school each year and for what reason.

RESULTS

Registration in all primary schools in Idere during the period of the study was 1,495 pupils (768 boys and 727 girls), 68% of children (6–14 years) in the village. GWD was present in 21.2% of the pupils, with more females (22.3%) infected than males (20.2%). Figure 1 shows the proportion of pupils absent by class level during the 1981–1982 school year. Periods of high absenteeism correspond with the height of both dry season and guinea worm season in the village. GWD was the major cause for missed school days, and, during January–February, it represented almost the entire reported cause for nonattendance in schools. Absenteeism declined as guinea worm season waned. Figure 2 shows pupils with GWD were absent from school longer than non-guinea worm-infected pupils. The average absence for GWD was 9 weeks vs. 1 week for non-guinea worm absence. This represents 25% and 2.5% of missed days, respectively. School records indicated that approximately 5.7% (85) of the pupils registered in schools permanently dropped out due to guinea worm infection, while the corresponding proportion of pupils who dropped out for non-guinea worm-related reasons was 0.8% (12). GWD was the reason for the initial absence of 88% of the 97 pupils who never returned to school.

DISCUSSION

Importance of clean water supply and proper waste disposal is a difficult concept to teach the pupils in Idere primary schools because sanitary facilities are absent in the entire community. This study found that as a consequence of guinea worm infection, over 21% of Idere pupils in primary schools did not benefit from the educational opportunities provided through the school system. No provision is made for home or individual tutoring. In Nigeria there is a strong link between literacy and attainment in leadership.

For pupils who are chronically infected with GWD to optimally benefit from the educational system, education in personal and community hygiene should become an essential component of instruction in primary schools in Idere. Collaborative effort by administrators of education and social service agencies is necessary to provide essential sanitary amenities to promote school health in rural villages, including the provision of adequate pipe-borne water and toilet facilities in primary schools and in the community. The transmission cycle of GWD is known to be interrupted in a relatively short period when adequate pipe-borne water is provided to an endemic community.[4-9]

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ILLNESS BEHAVIOR IN GUINEAWORM DISEASE*

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ABSTRACT

Guineaworm, a waterborne helminthic disease, affects a large portion of the population in Idere, Nigeria. Although preventive health education interventions are experiencing success, it is slow due to the low economic status of the community. In the meantime people suffer and seek treatment. The decision-making process during illness with guineaworm does not fit neatly into individual psychosocial theoretical models. Concepts of the disease and potential remedies are strongly influenced by the local culture. In the process of studying these cultural influences, suggestions for new models have arisen. These suggest a mediating role for health education between traditional and Western scientific viewpoints in promoting efficacious illness behavior in endemic tropical diseases.

According to the elders, suffering from guineaworm, a waterborne helminthic disease, has been a daily part of life in the dry season since time immemorial in Idere, Nigeria. Efforts to prevent the disease using community health education to promote safe water supplies have been underway since 1978 [1]. Results have been slow but steady, reducing the prevalence of disease in selected farm hamlets to near zero and cutting the rate in the main town in half from a 1980-81 dry season high of 42 percent to a low of 21 percent in 1984-85.

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Since change, which relies mainly on a poor community's willingness and ability to help itself, is gradual, suffering and disability from guineaworm persists and must be addressed alongside of preventive measures. Contained herein is a view of how Idere people continue to cope with guineaworm. This provides an opportunity to question the ability of existing theoretical models to explain illness behavior in crosscultural settings, especially when the efficacy of Western medicine is in doubt.

NATURE OF THE DISEASE

Guineaworm or Dracunculiasis is common in tropical regions from South Asia through the Middle East into Africa. The adult female worms, growing up to one meter in length are found in subcutaneous tissue usually in the lower limbs of the human host. When the work is ready to release its larvae, it causes an ulcer to form on the host's skin. When the host comes in contact with water–bathing, washing, fetching, wading–the worm protrudes and expells the larvae. These are later ingested by appropriate species of a crustacean known as cyclops wherein they grow to an infective stage after fourteen days.

When water containing infected cyclops is drunk, guineaworm larvae are released in the host's stomach. They penetrate the stomach wall and migrate to the subcutaneous tissue. Nine to twelve months later they have grown and are ready to expel their own larvae. This cycle naturally ensures that emergence of worms coincide with the dry season in Western Nigeria, when concentration of cyclops in depleted ponds is at the highest.

On the surface the disease would seem easy to control by preventing water contact or providing potable water supplies [2]. Unfortunately a number of social, cultural, economic, and geographical factors inhibit smooth implementation of control plans [3]. In the meantime people still suffer and search for treatment.

LIMITS OF WESTERN MEDICINE

Modern treatment for guineaworm consists primarily of Niridazole, a drug commonly used for schistosomiasis, although others have been tried [4,5]. Niridazole does not provide a radical 'cure' but simply reduces inflammation and hopefully speeds ejection of the worm, a process which may take several weeks under normal circumstances. Modern medication has several drawbacks. It does not appreciably reduce the time it would take for the worm to emerge naturally. Secondly there are side-effects–a startling discoloration of the urine and the possibility of nausea and neurological reactions. Thirdly, the drug is expensive, not often stocked by local government health facilities, and available on the market at a cost of about $10.00 for a full course. Clinical experience of one of the authors indicates that simple aspirin to relieve the pain that often accompanies the emerging worm is just as efficacious as Niridazole and much less expensive.

Still, modern treatment does offer some benefits especially when it includes proper cleansing of the ulcer site [6,7]. The ulcers are susceptible to disabling secondary infections including tetanus. Treatment which includes dressing of ulcers also serves to inhibit host water contact and thereby becomes a useful control measure [8]. The lack of efficacious modern therapy, a not uncommon problem with many endemic tropical diseases, raises some important questions when studying illness behavior.

MODES AND MODELS OF INQUIRY

The Health Belief Model (HBM) has become one of, if not the most popular paradigms for explaining health behavior, be it preventive, illness, or sick role [9]. While it has been conceptually applied to illness behavior [10] few of the many studies using the HBM have put it to the test at that level, and those look primarily at clinic utilization [11], only one of many options open to an ill person.

Studies based on this individual decision-making model fall into a category of social research termed correlational [12]. As such the following HBM components were found to have high correlation with outcome behaviors: perceived barriers, perceived susceptibility, and perceived severity (for sick role only). Low correlation was noted between outcome behaviors and perceived benefits and for preventive behavior with perceived severity [11].

Although the HBM contains a sociodemographic component labeled "modifying factors," this would appear from the scope of research on the model to be more of an aside. Inquiry that focuses on psychosocial correlates of individual behavior misses two major areas of concern to crosscultural health study: 1) the very process of how decisions are made in a world that is naturally full of choices, and 2) the cultural context that defines individual perceptions, social responses, health technologies, and choice making. The gap can be filled with research using a strong descriptive approach [12] exemplified by indepth case studies [13]. It appears that the nature of illness behavior, where so many issues and options confront the individual, necessitates a qualitative research approach.

Mechanic sees illness behavior as a process that does not neatly fit the confines of a model [14]. "Thus the study of illness behavior involves the study of attentiveness to pain and symptomology, examination of the processes affecting the way pain and symptoms are defined, accorded significance and socially labeled and consideration of the extent to which help is sought, change in life regimen affected and claims made on others."

By taking this broader approach, a lay referral system, rooted in cultural definitions of illness, becomes evident [15]. Such a system may lead in many directions, not necessarily those approved by modern health professionals. Obviously decision making still plays a central part in the process, but there must be recognition, not just of varied options, but also of continuous decision making over time until desired results are seen or resignation to fate occurs. The complexity of the process is influenced by the degree of culturally determined certainty or uncertainty with which definition of symptoms and effectiveness of options are perceived [16].

Understanding of illness behavior in guineaworm disease among Idere residents was derived from various sources over a four-year period in conjunction with implementation of a community-based primary health care program. A baseline survey of all Idere heads of household, some 1935 in number, gathered data on beliefs and reported practices concerning guineaworm and other endemic diseases. In contrast to initial expectations it was not the survey which proved the most valuable data source. Instead participant observation, within the context of the primary health care program which fostered close interpersonal relations between community members and research staff, produced the most extensive and valid information. This was supplemented with case studies of individual sufferers of guineaworm, review of clinic utilization records, interviews with traditional healers, and supervisory reports on the activities of the trained village health workers.

A composite discussion is presented here drawing from the different data sources. In the process the relative value and limitation of each source is described. The resulting picture of illness behavior suggests the need for reconstructing health behavior models for crosscultural application.

RECOGNITION OF DISEASE

Crucial to the initiation of illness behavior is the recognition of symptoms and the attribution of meaning. Perception, definition and labeling of a body state as a symptom is culturally determined and is part of a social process [17]. Interviews with Idere residents show consistently well developed recognition of guineaworm's associated symptomatology. The constellation of symptoms which herald the appearance of the guineaworm ulcer may begin with headache, body ache, and often fever. Itching, swelling, and rashes are reported. Pain in a localized area precedes the appearance of the blister. The worm will actually emerge and form the characteristic ulcer upon contact of the affected site with water.

When a person from Idere suffers the above symptoms there is no doubt in his/her mind that he/she has guineaworm. Self-diagnosis is made in the context of certainty [16] and the decisions on remedy are straightforward. There is no perceived need for professional consultation to achieve diagnosis. It is not only certainty which propels Idere residents into self-diagnosis and eventually self-care, but the fact that when cultural definitions of illness contradict those of

the health professionals, these will receive few lay referrals [15]. In fact, in Idere definitions of guineaworm disease go beyond recognition of the visible, emerging worm.

Guineaworm is blamed for a number of internal disorders. Any swelling or subcutaneous nodule is thought to be the work of guineaworm, even if no worm has emerged for years. Stomach disorders are often attributed to guineaworm. Some Idere women complain that it "disturbs their pregnancies." As will be seen below, Idere people truthfully feel that guineaworm is actually part of their body, a notion quite divergent from modern medicine's view. Only recently have clinicians begun to take serious notice of those worms that for whatever reason do not migrate to the surface, but become entangled in other tissues.

IDEAS OF CAUSATION

Survey research in traditional societies often yields misleading results as is evidenced by Idere people's beliefs about guineaworm. Prior to the 1978 pilot primary care intervention in Idere only 4 percent of adults were conversant with scientific explanations of disease cause. Awareness had increased greatly by the time of the 1981 baseline of the expanded study and intervention to 50 percent [1,18]. Yet case studies of individual patients and discussions with key informants in the community showed another perspective.

In the beginning of almost any conversation on the disease, Idere residents will mention that "bad water" causes guineaworm. After discussion progresses and people feel at ease, they will explain that even though they *know* guineaworm is supposed to be carried in water, they actually *believe* the disease is "in the body." Some people visualize the worm as a vein or tendon that has come loose or that the worms are naturally part of these tissues. The disease is in everybody, claim some, while others feel it is hereditary.

The question of why the worm emerges mainly receives the answer: the person's blood has gone bad or become weak. This is an admittedly vague response as such blood problems have varied possible causes—overwork, stress, improper behavior, or diet. Another explanation heard occasionally is that the worm will come out when it "smells" a protruding worm on another person. High body temperature is another factor thought to make the work emerge.

When the disease reaches an abnormally high level as happened in the late 1970s after the failure of the town's pipeborne water system, supernatural causes may enter the picture. *Ṣọpọna*, a dreadful local diety representing the wrath of the Supreme Being, is blamed by many Idere citizens for the increase in cases. *Ṣọpọna* has traditionally been associated with smallpox outbreaks, but any high temperature, especially accompanied by restlessness, boils, and rashes are blamed on the diety. The initial symptoms of guineaworm neatly fit this description, and occur in the dry season, the time when *Ṣọpọna* is most active [19]. It is important to note that blaming *Sopona* does not counteract the belief that guineaworm is in the body but simply implies that *Sopona* is the agent responsible for making the worm emerge in some people or at certain times.

The view of causation outlined above allows little room for specific notions of prevention. In fact many Idere people say guineaworm cannot be prevented. Scientific medicine is most likely to be accepted when its theories articulate with folk theories [20]. In the case of guineaworm there is little convergence between the scientific and folk perspective and not surprisingly little belief in modern preventive and therapeutic technologies.

NORMAL PROGRESSION AND TREATMENT

In Idere the normal progression of guineaworm once the ulcer has formed is eventual discharge of "bad white blood," followed by slow natural expulsion of the worm. Treatment of a normal infection has three main phases. As soon as swelling is noted, palm oil is smeared on the site for its soothing effects. After the ulcer forms, other ingredients are added to the oil for their cooling properties or ability to draw the worm out. *Ewe imin (Chenopodium ambrosioides),* literally "excreta leaf," a name undoubtedly derived from its strong smell, is the most common additive to palm oil. Of 250 guineaworm cases recently studied in Idere, 58 percent reported use of this mixture.

Other oils such as palm kernel oil and herbs like tomato or hemp leaves may be used for the same purpose. There have been reports of adding ground dog bones, lantern soot, and insecticides. Not only does this variety reflect the individualized nature of home remedies, but also the persistence of the infection. People say that a remedy that helped one year may not evoke the desired response the next. Also the worm is said to be more stubborn in recent years requiring the trial of several remedies concurrently or serially in a given season.

The choice of oil, particularly palm oil as a remedy itself and as a medium, for herbs, has a cultural base. Remedies used to heal ailments associated with *Sopona* are called *ẹrọ*, that which softens (the diety) or eases the restlessness of the sufferer [19]. Sacrifices of propitiation to *Sopona* include soothing or cooling items like palm oil, palm wine, and solidified corn pap *(eko tuta)* [21]. Palm oil is also part of the traditional treatment for small pox and is taken internally mixed with powdered herbs [22].

The third phase of guineaworm treatment follows complete expulsion of the worm. *Oluganbe* leaf *(Ipomoea asatifolia)* is boiled. The water from boiling is used to clean the ulcer. Then the leaves are used to plaster the site. A traditional proverb in the Yoruba language attests to the importance of this herb:

> *Ti sobia yoo ba di egbo,*
> *Oluganbe ni a a ranṣe si.*
> (Before guineaworm becomes a sore, it is *Oluganbe* that we call for.)

This proverb is often used in a broader context as an analogy for seeking timely solutions to any problem.

It is important to note that in traditional practice no dressing is done on the ulcer until the guineaworm has emerged completely on its own. Covering the site before emergence is felt to anger the worm and make it fight to find another outlet, a reportedly painful experience.

HANDLING DISABILITY

Unfortunately guineaworm does not always follow the natural progression. A traditional song in Idere pleads with *sobia* (guineaworm) not to cause the disability and incapacitation that come when secondary infection sets in:

> *Sobia, sobia ma ṣe mu mi o*
> *Sobia, ẹni o da lateṣi ko le rin o*
> *Sobia, sobia ma ṣe mu mi o*
> *Ẹni o da lateṣi ko dide*
> *Sobia ma ṣe mu mi o, sobia*
> (Guineaworm don't catch me. Those you knocked down last year still can not walk. Guineaworm don't catch me. Those you knocked down last year still can not stand up. Guineaworm don't catch me.)

The word *da* means "knocked down" and is a wrestling metaphor indicating that the victim is actually fighting with the disease.

This plea is quite justified because people who are knocked down with disability miss weeks or months from school or work [23,24]. At this point the decision-making process becomes more complicated as remedies are traded within and among families and tried individually or in combination in hopes of gaining relief. Traditional healers may be consulted, but none of the more than thirty still functioning in Idere claimed to have a radical cure for *sobia* (in contrast to claims they make for curing a wide scope of problems from infertility to malaria).

A time may come when the sufferer resigns himself to fate, unable to move from his house until the condition resolves itself some months later. If the person is still somewhat mobile he may be among the very few who are willing to give "English" medicine a try. The disability period reflects a cycle of decision making where outcomes are evaluated and re-evaluated until finally accepted [25].

CLINIC UTILIZATION

Two clinic services are available to the Idere people. One is a local government dispensary/maternity in Idere and the other is a state government rural health centre in the nearby town of Igbo-Ora, seven kilometers distant. The former is staffed by a pharmacy assistant and a midwife while the latter has nurses, physicians, midwives, pharmacist, and health educator. Both facilities obtain their supplies from the state pharmacy stores, but the health center tends to have more direct and reliable access. In recent years, chronic shortages of drugs and supplies have been common in both sites.

Standard treatment given for guineaworm includes Niridazole, tetanus immunization, antibiotics (in the case of secondary infections) and dressing of the ulcers. Until 1984 these services were provided free of charge, but now a minimum fee of $2.50 has been introduced.

During the 1981 baseline survey when asked how to treat guineaworm 36 percent of respondents said "go to hospital," the largest single response and more than double those suggesting traditional remedies. A majority (75%) went further to opine that the hospital/clinic was the best source of treatment for the disease. This provides a prime example of respondents saying what they feel researchers want to hear, as actual utilization figures belie this supposed trust in Western medicine.

For example, during the dry season of 1982-83 only 110 Idere residents attended either their dispensary or the Igbo-Ora Rural Health Centre for treatment of guineaworm. This represents approximately 4 percent of all those who suffered from the disease. The rest, of course, relied on self-care.

Based on census data obtained during the 1981 baseline survey, little difference was seen between this small group of clinic attenders and the general population. Ages ranged from four to sixty-three years (guineaworm rarely affects the preschool age group). A little more than half the patients (52.7%) were aged eighteen years or younger, although this group represents slightly less than half (46.7%) of the town's population. The male:female ratio of 1:1.157 is similar to the overall community. Finally, geographical distribution was proportional with 55 percent coming from the east end of town where approximately 56 percent of citizens live.

If these patients were not particularly different from the general population, are there other reasons to account for their seeking modern care? Followup discussion with twelve patients gave some ideas about their utilization behavior. Two of the patients said that when they went to the clinic they had not intended to complain of guineaworm, but had presented symptoms of other problems that were bothering them. It was the doctor who had noticed the guineaworm and decided to prescribe treatment. These two patients had been satisfied with their home remedies and had not even considered guineaworm to be something the health centre should treat.

Three reasons were found for intentional clinic attendance. All noted that the disease had not been progressing normally. A couple noted that the ulcer had been discharging red blood in addition to the normal white discharge. Five attenders sought modern care only after being visited by medical students who are conducted on weekly community diagnostic tours of the two [26]. Two patients said they sought clinic care because of past positive experiences with it.

While these interviews indicate that factors such as perceived severity, cues to action and perceived benefits/efficacy may be at work, one must remember that 96 percent of the population did not make use of this service. During the guineaworm season, hundreds of sufferers can be found at home who complain of the severity of infection. Medical students and health center staff visit many of these homes, and yet the yield of response is poor.

Some few may perceive some benefit from treatment, but only two of the twelve interviewees noted any improvements from the medicine prescribed. Rumors spreading from dissatisfied patients may account for the fact that 35 percent of respondents on the baseline survey said that modern medicine does not cure guineaworm and 1 percent felt it worsened the condition (a possible reference to side effects of the drugs). Most of the respondents could not say what the outcome of modern treatment was (52%), while 12 percent were willing to say modern medicine helps.

Barriers to utilization may be at work and might include unavailability of drugs and the high cost of purchase from medicine stores. The Idere dispensary had Niridazole in stock only for the month of December 1982 and the cost of transport to and from Igbo-Ora is about $1.25. Problems of perceived efficacy may also figure. Patients tend to believe in the value of modern drugs which bring quick and obvious relief, as in the case of many injectable drugs [27]. Guineaworm medications at present can not live up to these standards expected of modern medicine.

Since guineaworm treatment cannot live up to the standards expected of Western medicine, the discussion comes back to the cultural issue. That is, there is little convergence between traditional and modern theories about the disease. Modern treatment does not recognize the underlying causes which need a soothing, appeasing therapy. Instead, dispensers give tablets with side effects and dress the ulcer thereby angering the worm. Experience of the trained primary health workers in Idere showed a need to delete guineaworm ulcer dressing from their repertoire of skills as patients either refused treatment or had removed the dressing by the next day. Attempts to remove or unwind the worm on a matchstick did not appeal to people either.

CHOICE BETWEEN CLINICS

Although modern care appears to be a minor option in guineaworm treatment, those who did use it made choices. Implications of these choices should be borne in mind if modern care ever hopes to become more relevant in the treatment of guineaworm.

Overall 70 percent of those 110 patients chose to attend the rural health centre in Igbo-Ora. Health centre attenders were predominantly adults (57% were over eighteen years old) while 76 percent of dispensary patients were children (X^2 = 10.032, 1 degree of freedom, $p < 0.005$). Concerning residence, 61 percent of health centre attenders were from the eastern half of Idere compared to only 35 percent of dispensary patients ($X^2 = 4.932$, 1 degree of freedom, $p < .05$).

The general preference for the health centre might be explained by the presence of more highly trained staff and a better stock of supplies. Not everyone could afford this option, particularly school children and the residents of the somewhat poorer western end of town. Convenience may also be a concern of the school children who would want to be treated quickly and return to the classroom.

This situation demonstrates some of the problems of delivering primary health care. The facility that is closest to the people is often neglected by the health services, reinforcing a belief that good care is given only where one finds a doctor.

RETHINKING THEORIES

Guineaworm provides a good example of the phenomenon whereby people classify problems according to whether they can be cured by traditional or modern medicine [28-30]. Conditions begin to accumulate in the latter category only when modern medicine begins to demonstrate empirically a success in curing that meets the standards and expectations of a particular culture [27,31]. Efficacy is therefore a relative concept set in a cultural context and dependent on a value and social structure [20,32,33].

Using these concepts and the experience gained from studying illness behavior in guineaworm disease it is possible to construct a more process-oriented model (see Figure 1). Individual decision making is enmeshed in the context of culture which defines symptoms, causation, and solutions. Interaction with others within a lay referral system is recognized. Also considered is the continuous process of decision making which recognizes periods of certainty and uncertainty as options and outcomes are evaluated and re-evaluated, ultimately arriving at a condition which the patient accepts, a reality possibly quite different from the goals of Western scientific medicine.

The interaction of different cultures—traditional and professional—open up other options to the decision-making process. The degree of overlap of traditional and scientific theories on a particular condition determines the extent to which modern options might be considered in the choices made. In the case of guineaworm, the overlap is small and the existing healing technologies are not efficacious even by modern standards. This therefore confines decision making primarily to the traditional cultural sphere.

Health education has a role in this model, and its clients are within both cultural spheres. The aim is not only to make modern healing technologies available and desirable to the traditional population, but also to provide feedback to the modern medical scientists so that they may modify their technologies to become more acceptable and useful to the community.

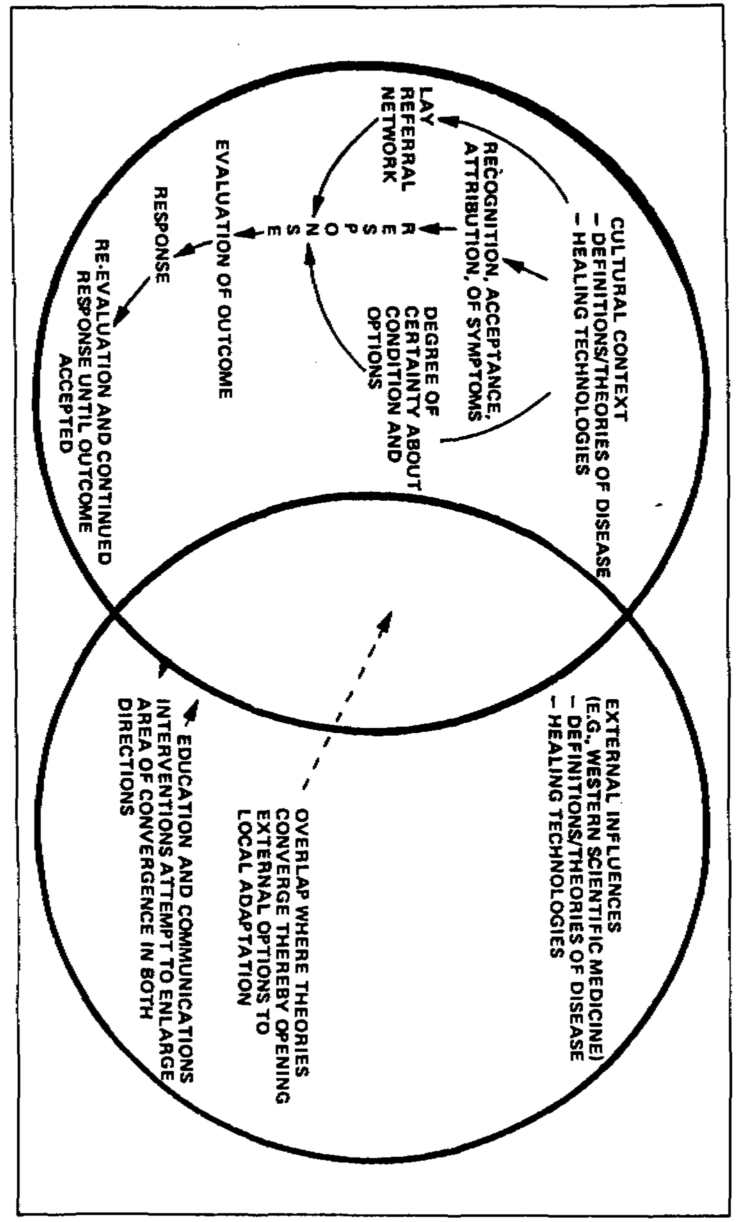

Figure 1. Illness behavior in a crosscultural setting.

In Idere, the relative success of health education for prevention rests mainly on the fact that reliable water supply (aside from any notions of disease causation) is a practical felt need of the people. Concerning guineaworm treatment a truly effective cure lies somewhere in the future. In the meantime insights gained by studying illness behavior have been used to modify the approach of the primary health workers. They are now taught the need of identifying guineaworm patients early before disabling secondary infections can occur. The need for regular cleansing of the wound with antiseptic solution prior to application of any oils is stressed. Messages given the population do not conflict with traditional beliefs but simply state that the open ulcer, if unclean, gives opportunity for other troubles to enter the body and produce disability.

Fortunately the primary health workers have been more vigilant, and no cases of tetanus have been reported in recent years. But even though prevalence has decreased, those with the disease continue to experience long periods of disability. Hopefully efforts at prevention will speed up so that the issue of treating guineaworm will become irrelevant. Even if this is achieved there are other endemic diseases in Idere that are less easy to prevent—onchocerciases, malaria and diarrhoeal diseases to name a few. Therefore what has been learned by studying guineaworm illness behavior in a crosscultural context will have application and value for continued primary health care and health education interventions in Idere.

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Surveillance: The Foundation for Control and Elimination of Dracunculiasis in Africa

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The International Drinking Water Supply and Sanitation Decade (1981–1990) has stimulated a movement to eradicate human infection with the helminthic parasite *Dracunculus medinensis* (dracunculiasis), whose victims are disabled for weeks or months during the painful emergence of one or more worms from beneath the skin. Each year, millions of people acquire this infection by drinking unclean water.

Among the critical activities that are necessary for the elimination of dracunculiasis, one of the most fundamental is that of epidemiological surveillance. Surveillance activities play a key role in the strategy to target affected villages for improved water supplies and other control activities. Accurate surveillance data also stimulate interest and support for national eradication programmes.

Dracunculiasis is a condition with excellent characteristics for reporting through passive surveillance systems. However, active surveillance, as well as other innovative surveillance strategies, should be used to establish baseline information in those villages where cases occur, and later to monitor epidemiologically important indices needed to evaluate the progress of elimination efforts.

Human dracunculiasis (guinea-worm disease) is caused by the parasitic worm *Dracunculus medinensis*. Human infection is acquired only through ingestion of water contaminated with microcrustacea of the genus *Cyclops*, which act as the intermediate hosts for the parasite. Larvae contained within some of these crustacea are released by the digestion process, penetrate the human intestine, and migrate to deep subcutaneous tissues. The parasites grow and mate, and after about a year the gravid females elicit painful blisters, usually in the lower extremities. When these blisters break, the worm is exposed at the base of the resulting ulcer. Upon immersion in water, the worm releases many thousands of immature larvae which may be ingested by cyclops. The larvae that are ingested may develop, after a period of about two weeks, to the infectious stage. The life cycle continues with the infection of the next person drinking the contaminated water.[1,2]

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The manifestations of the infection in humans are generally not apparent until the emergence of the female worm. Although the parasite dies shortly after erupting from under the skin, the patient must gradually extract the lengthy (60–100 centimeter) body, a few centimeters a day, over a period of 2–6 weeks. During this time, secondary bacterial infection of the ulcer is common, and the patients suffer variable degrees of disability. In some cases, active dracunculiasis is complicated by deep abscesses, septic arthritis, and tetanus.[1,2] Permanent disability occurs in an estimated 0.5% of patients.[1]

Long-term carriers of guinea-worm do not occur because the infection is self-limited, terminating at the end of the one-year lifespan of the worms. Unfortunately, there is no evidence of acquired immunity to dracunculiasis since annual recurrence in the same individual is common in highly endemic regions. Since no drugs are known which kill the worms before they emerge, prevention of infection is the most effective means of control. Given the short lifespan of the parasite and the absence of important animal reservoirs, preventive measures rapidly reduce incidence.[1,2]

Almost from its inception, an official subgoal of the International Drinking Water Supply and Sanitation

Decade (IDWSSD: 1981–1990) has been to monitor the impact of providing safe water supplies on the incidence of dracunculiasis. Since dracunculiasis is transmitted *solely* by contaminated drinking water, a decline in cases serves as a sensitive, health-related indicator of the effectiveness of rural water supply programmes. Furthermore, fulfilment of the Decade's objectives would result in global elimination of dracunculiasis. The excitement stemming from this concept has given the guinea-worm effort a momentum that will carry it beyond the close of the IDWSSD in 1990.

EPIDEMIOLOGY IN AFRICA

The "Guinea-worm Belt" stretches across the African continent from Mauritania to Ethiopia.[1-3] Dracunculiasis transmission is most widespread and intense in West Africa (Mauritania, Senegal, Cote d'Ivoire, Benin, Ghana, Togo, Niger, Nigeria, Mali and Burkina Faso). In these, the most highly affected countries in the world the infection is found in most provinces and states. In some villages annual incidence may exceed 75% of the inhabitants.[4] Dracunculiasis is less widely dispersed in Cameroon, Guinea, Sudan, Ethiopia, Uganda, Kenya, The Gambia, Chad, and the Central African Republic (CAR). In a careful assessment of passively reported and published survey data, Watts (1987) estimated that 3 320 000 cases of dracunculiasis occurred annually in Africa.[3] The number of people at risk (ie, the rural population of districts, states or provinces where guinea-worm infection has been recently reported) is thought to be near 120 000 000.

THE ROLE OF SURVEILLANCE IN THE DRACUNCULIASIS INITIATIVE

Surveillance data plays a dual role in the dracunculiasis initiative. First, strengthening epidemiological surveillance has an operational goal of providing health officials with knowledge of the affected administrative areas (provinces, divisions, districts and villages). These data can then be used to deploy IDWSSD water activities to affected communities. Other proven control measures in such areas might include chemical cyclopsicides, provision of water filters for personal use of the villagers (to remove infected cyclops from unsafe water), and health education programmes.[1,5] In subsequent operational phases, the surveillance system would be used to monitor the impact of these activities on the incidence of dracunculiasis.

The other role of surveillance is to provide reliable data needed to publicize the initiative and to secure political and financial support for the international eradication campaign. Accurate case counts can convey the message to national decision makers, international and bilateral agencies, primary health care workers, and the general public that dracunculiasis is an important health problem that can be promptly eliminated when the appropriate steps are taken.[5]

DEFINITION OF SURVEILLANCE

A surveillance system recognizes and reports information of public health interest to public health authorities. This process should be timely, but not time-limited: the ideal surveillance system is one in which cases are quickly, accurately and continuously reported. A surveillance system, however, is not simply a filing mechanism, and its end should not be one of simply gathering data. The term surveillance should suggest dynamic exchange between people, in which information is continuously assembled, considered, and communicated.[6] Health managers who receive surveillance reports are responsible, through 'feedback loops,' to return processed information to those who originally collected the data. In this loop, a timely and easily comprehended analysis, conveyed by means of newsletters, conferences, and/or individual meetings, filters back down through the various levels of the reporting system. The returns can also be used to provide updates on control activities. Surveillance systems thus maintain interest among the reporters, and serve to foster dialogue at all levels.[6-8] A surveillance system should also forward data to interested national academic institutions outside of the government, to the press and to concerned bilateral and international organizations (especially the World Health Organization—WHO). WHO and other regional health organizations act in another 'feedback loop', providing reports which present a global perspective, and, at times, serve as a resource for consultation, technical assistance, and funding. Finally, surveillance data should play a central role in the planning and evaluation of control strategy and tactics. Control activities, in a sense, represent the effector arm of the surveillance system, and should be prioritized, guided, and evaluated by surveillance data.[6-9]

COLLECTING SURVEILLANCE DATA

Passive Surveillance

Surveillance statistics are most commonly and economically collected passively, through reports filed by fixed health facilities such as dispensaries, clinics, and hospitals. These reporting units comprise a 'primary' data collections system providing information to central authorities on numbers of cases of the targeted ('reportable') diseases seen within a certain period. Although passive data collection systems may provide a continuous source of information, they are dependent upon the health seeking behaviour of people with the condition of interest, the distribution and accessibility of the fixed reporting units, and the efficiency of often poorly trained or disinterested personnel. These personnel are asked to complete, process, collate, and submit what may be overly complicated forms through a health care hierarchy that often provides little indication that the data is used or even reviewed. Therefore, data provided by a passive surveillance system must be interpreted with care, and even in the best of circumstances, passive systems underreport, or provide an otherwise inaccurate account, of the actual numbers of cases which occur.[6,7,9] However, the considerable usefulness to eradication programmes of passive reporting systems in developing countries was proven during the smallpox campaign.[7,8]

Active Surveillance

In contrast to passive systems, active surveillance provides more complete and reliable information about a disease. Active surveillance uses mobile agents who carry out community-based monitoring of the condition of interest. Such activities are relatively expensive, require trained and well-supervised personnel with a means of transport, and are usually time-limited. Two kinds of active systems may be distinguished: 1) *Comprehensive Searches*, in which *all* potentially affected communities are visited, and 2) *Sample Surveys*, in which statistical sampling techniques are used to select those communities to be visited by the mobile teams.

Other Forms of Surveillance

Various innovative techniques, which contain elements of both passive and active systems, have been developed for surveillance in developing countries. These innovations, many of which were pioneered during the smallpox eradication campaign,[7-10] are less expensive than active surveillance but provide data which are more reliable than those reported passively. Among these techniques are 'mailed' questionnaire surveys, sentinel systems, market place searches and school searches.

UNDERREPORTING OF DRACUNCULIASIS BY PASSIVE SURVEILLANCE SYSTEMS

Most afflictions of rural populations in developing countries are underreported by passive surveillance mechanisms,[7-9] and dracunculiasis is no exception. There are several reasons for this:

1) Dracunculiasis is generally a non-fatal condition, and these characteristically do not command the attention of health authorities. In contrast, acute, dramatic, and lethal diseases that are less prevalent may be better reported.
2) Dracunculiasis is extremely focal with respect to time (when), and space (where).[1,2,4,11] Most active cases occur during a circumscribed time of the year when the local ecology favours maximum concentrations of *Cyclops sp.* in drinking water.[1,2,12] Focality in space, however, does not vary dramatically with respect to time because the infection does not rapidly spread from one community to another, but tends to remain localized in one area. One village can be severely affected year after year while neighbouring villages are completely spared. This static positional quality results in a tendency for unreported foci of dracunculiasis to remain unreported. An example in contrast, measles infections occur focally, but the spacial quality of the infection varies dramatically over time. Because it is highly infectious, yet provides herd immunity, measles moves from village to village. This mobility through space results, simply by chance, in ultimate recognition of some cases by poorly distributed, fixed reporting units in the passive system.
3) There is no special treatment for guinea-worm disease other than worm extraction, tetanus immunization, and wound care. When the villagers realize that little more can be done for the condition at the clinic than in their villages, they lose the incentive they may have had to attend. Local cases may therefore go unrecognized by the health care system. A survey in Togo noted that less than 4% of the dracunculiasis cases studied were treated by health officials.[13] Similarly, of 3641 Nigerian patients with dracunculiasis, only 183 (5%) visited a hospital or health centre.[14]
4) Dracunculiasis occurs almost entirely in remote rural areas, among people served by the most peripheral units of the curative health care system. These facilities are usually poorly staffed, poorly supplied, poorly supervised, and difficult to reach. Communication links with the next level in the reporting hierarchy may be poor.
5) Since dracunculiasis is a disabling disease, many victims cannot walk to even nearby health facilities.

Extrapolation from the numbers of dracunculiasis cases that are *officially reported* to a figure approximating the actual incidence of disease is difficult.[15] For example, researchers studying dracunculiasis at the University of Ibadan in Nigeria estimated that between 150 000 and 250 000 cases occurred in the southwest section of that country in 1977,[16] yet in that year only 11 035 cases were reported to WHO from *all* of West

Africa.[17] In 1985, a recent year when a large number of African countries reported cases to WHO (Table 1),[15] ten countries counted a total of 14 754 cases of dracunculiasis. Assuming that this figure represents between one and five per cent of actual cases, as reported in the examples from Togo and Nigeria cited above, then an estimated 300 000 to 1 500 000 were afflicted in those ten countries alone. This figure requires further adjustment to include the other nine African countries known or suspected to have transmission of guinea-worm disease, which include Nigeria, the most populous and among the most severely affected countries in Africa.[3]

FAILURE TO REPORT OFFICIAL FIGURES

Underreporting at least acknowledges the existence of guinea-worm disease, and, therefore, these figures are preferable to the failure by many endemic countries to provide any totals whatsoever. It is apparent from a review of surveillance data available to WHO for the years 1980–86 (Table 1) that just 35% of the 133 cells for annual totals are filled.[18,19] Five (26%) of the 19 African countries known or suspected to be endemic for dracunculiasis failed to provide any official figures during this seven-year period. One reason for failure to provide WHO with official figures for dracunculiasis is that cases of the disease are in fact not reported because dracunculiasis is not an officially notifiable disease in all endemic countries. Another reason may be the attitude that it is better *not* to report data in which there is little confidence, or which does not accurately reflect the actual situation.[7]

OVERREPORTING OF DRACUNCULIASIS

Although uncommon, a national passive reporting system may overreport dracunculiasis (ie file false case reports). The most common causes for overreporting are clerical errors committed by health personnel while completing or reading report forms. However, overreporting may also occur when dracunculiasis is not differentiated from other endemic filariases (lymphatic filariasis, loaisis, onchocerciasis, etc.) on report forms. Often there is a single figure under a common category entitled 'filariasis' (Table 1—Niger). In some instances, all helminthic diseases, including intestinal helminths, may be listed as a single category on national report forms. Yet another (rare) reason for overreporting is misdiagnosis of some other condition, eg myiasis or cutaneous larva migrans, by inexperienced health workers.

ADVANTAGES OF DRACUNCULIASIS TO A SURVEILLANCE SYSTEM

Despite the multitude of problems described above, certain characteristics of guinea-worm disease are advantageous to surveillance mechanisms in developing countries. One is the specificity of the visual diagnosis, which obviates the need for confirmatory

TABLE 1 *Reported cases of Dracunculiasis by Year, Africa, 1980–1986*

Country	1980	1981	1982	1983	1984	1985	1986
Benin	—	—	—	—	—	—	—
Burkina Faso	2620	—	—	4362	—	458	1837
Cameroon	—	—	—	—	—	168	86
CAR	—	—	—	—	—	—	—
Chad	—	—	—	—	—	—	—
Côte d'Ivoire	6712	7978	—	2259	2573	1589	—
Ethiopia	—	—	—	—	2882	770	1099
Gambia	—	—	—	—	—	—	—
Ghana	2703	553	3413	3040	4244	4060	3691*
Guinea	—	—	—	—	0	0	—
Kenya	—	—	—	—	—	—	—
Mali	816	77	401	428	446	510	—
Mauritania	651	663	903	1612	1241	—	—
Niger	1906	2113	1530	—	—	1373**	—
Nigeria	1693	—	—	—	—	—	—
Senegal	161	—	—	—	—	—	—
Sudan	—	—	—	—	—	—	822
Togo	1748	951	2592	—	1839	1456	1175
Uganda	—	—	—	—	6230	4070	—

*Provisional

**includes other filariases

(Sources: *Weekly Epidemiological Record* 1986; 61: 29–32 and *Weekly Epidemiological Record* 1987; 62: 337–339.)

laboratory tests and allows health workers with minimal training to detect cases. Guinea-worm lesions usually occur in the distal lower extremities, which are parts of the body accessible for examination in most cultural settings. Finally, guinea-worm disease is well-recognized by villagers and frequently has a unique name in the local language.

The history of having had an emerging worm is quite specific, and this minimizes the need for data collectors to actually find and examine those who are afflicted. Interviews with relatively few informants can rapidly provide data for entire communities or families. In fact, history of infection (ie, presumptive cases which are unconfirmed by observation) over a defined time period can provide a more vital surveillance index than does a count of those patients actually observed to have an emerging worm (ie, confirmed cases). Confirmed case counts provide a measure of point prevalence, which is an unstable parameter in dracunculiasis epidemiology, varying markedly with time of year when measured. History of infection during the last year (acquired through an interview incorporating a local calendar of events to estimate the onset of infection) allows more complete case ascertainment, as well as a measure of incidence.[20]

Another advantage guinea-worm disease offers epidemiologists is a predictable duration of infection and an absence of a carrier state. Current infections reflect exposure to infected cyclops within the previous 10–14 months, as latent parasites will not suddenly erupt after a longer period of time. In addition, previous disease does not seem to influence outcome of subsequent exposure to infectious larvae. Operationally speaking, the most important case characteristic is the travel history, to differentiate locally acquired from imported cases.

ESTABLISHING A DRACUNCULIASIS SURVEILLANCE SYSTEM

Definitions

Definitions are critical in surveillance systems in that they ensure understanding and comparability of information reported from different areas and by different individuals. They also allow mutual understanding of declared goals.

1) *Case definition:* The WHO Collaborating Center for Research, Training and Control of Dracunculiasis at the Centers for Disease Control (CDC) has proposed for the purposes of surveillance, the following definition: 'An individual exhibiting, or having a history of a skin lesion with emergence of a guinea-worm.'[21] A recent (ie within one year) history of a skin lesion with emergence of a guinea-worm is the proposed time frame for surveillance programmes. In the final phases of a national elimination programme, it is advantageous to refine definitions to differentiate confirmed cases, in which an investigator or health worker has observed the worm under or extending from the skin, from presumptive (historical) cases.[15]
2) *Area endemicity:* An endemic area is defined as a local administrative or social unit (eg, community, village, hamlet, province, district, town, city) in which indigenous cases of dracunculiasis have been observed or reported (documented by trained personnel or from information elicited through questions to community residents) during the previous 1–2 years. Hyperendemic areas are those in which the annual incidence is consistently over 20%, mesoendemic 5–20%, and hypoendemic where the disease occurs, but the annual incidence rate is less than 5%. The term hypoendemicity may be further subclassified into 'sporadically occurring, locally acquired cases' and 'externally acquired cases.' Areas where the disease is known to be absent ('nonendemic areas') must be differentiated from those where it is unreported due to lack of information ('no data/unknown').
3) *Elimination:* Dracunculiasis may be considered eliminated from a community, village, hamlet, province, district, town, city or country if no new indigenous cases are discovered during two consecutive annual case searches.[15]

Passive Surveillance System

The Smallpox Program demonstrated that passive reporting could be very useful to an eradication effort if the national reporting system was strengthened and tailored to the needs of the movement.[-5] As a prerequisite to using the passive surveillance system, dracunculiasis must be made a mandatorily reportable disease. Careful attention should be paid to how the 'guinea-worm' category appears on the national case report form. To avoid confusion, a name for the disease should be used that is easily recognized at the grass-root levels of the health system, and that clearly separates dracunculiasis from other filariases. Detachable pages on the form could be considered. Indeed, completely separate, special report forms might be used if funding permits, and both the epidemiological situation and eradication programme warrant it.[7,9]

In addition to counting case reports, government authorities should note the rate of return from the various units. This will help in comparing the number of cases reported by units which have filed all of their required reports with the number of cases reported by units that have filed only a fraction of their required surveillance forms. Failures to report should be promptly followed by querying the delinquent unit. Negative reporting (ie, submission of 'nil' reports when no cases are being seen) should be encouraged to establish the representational nature of distribution determinations.[7]

Case reports should be verified from areas where transmission of dracunculiasis has not been previously documented. Unfortunately, in developing countries where telecommunications to rural areas are generally deficient, central health authorities are unable to easily confirm the accuracy of 'unusual' returns.[9] Since the most common cause of 'overreporting' are errors made by health personnel when completing or reading report forms, many may be caught by careful review of central level files. Field visits will frequently be required, however, and should be undertaken regularly to query reports, check on units delinquent in reporting, and motivate health personnel. The goals of these visits should include confirming the diagnosis (if any), determining if the infection was locally acquired, and promoting the local efforts to eliminate the infection. The education and training component of these field trips provide an important feedback loop to field personnel, and will result in more complete and regular passive reporting.[7] If queried reports are found to be faulty, the field team should take the necessary measures to prevent recurrent errors from occurring in that region.

'Mailed' Questionnaire Surveys

This surveillance technique serves not only as a cost-effective means for collecting data on distribution of disease, but also provides opportunities to promote the national elimination effort, and to educate health authorities and others about the transmission and control of dracunculiasis. To achieve these additional goals, informational materials and programme propaganda should accompany the questionnaires. In all other ways, however, the questionnaires should be designed to provide only those data needed for operational action. 'Mailed' questionnaires are particularly useful for collecting data during the lag that may occur in passive reporting of cases while this system is modified to better serve a more vigorous national eradication programme.

1) *Health facility surveys* are carried out using a short (generally one page) questionnaire sent through official Ministry of Health communication channels to health units which report to central data collection authorities. If resources permit, the questionnaires may also be mailed to physicians, nurses, midwives, and other health workers employed in the private sector. Questionnaires should be simple and require little time and effort to complete and analyse. They should be sent directly back to the central surveillance unit concerned with dracunculiasis, thus bypassing the delays which usually occur during passage through the traditional reporting system. To obtain acceptable response rates, the surveyors should 'sandwich' the questionnaire mailing between preparatory and follow-up notices. 'Negative' responses should be encouraged if there are no cases.
2) *School surveys* use the education system in the surveillance programme. Questionnaires are sent to teachers, who are invited to explain the manifestations of dracunculiasis to their classes, using a visual aid if available. The students are then asked if they have seen the infection in their villages. The results are recorded on forms and returned to data collection authorities.

Meetings

National and international meetings have been used to collect surveillance data, and provide another way of reducing the delays inherent in the passive reporting system hierarchy. Attending delegates can be made responsible for providing information on the extent of infection in their district, state, or country. They may also be asked to classify (in very general terms) the degree of guinea-worm endemicity in these areas. Using this technique, meetings in Nigeria (March 1985)[23] and at two WHO sponsored African Regional Workshops on Dracunculiasis (July 1986 and March 1988)[3,21,24] have generated maps showing disease distribution and/or provided other important information on trends of incidence.

Sentinels

Special posts for monitoring the trends of incidence of guinea-worm disease may be initiated and developed through the formation of special relationships between surveillance authorities and selected villages, health posts, private doctors, schools, etc.

Active case detection

The two forms of active surveillance (search and survey) play different roles in the strategy for elimination of dracunculiasis. Search activities provide the best information about infection distribution, while surveys can provide detailed descriptive epidemiology for the endemic areas.

1) *Searches* should provide comprehensive coverage of the known or suspected endemic area. In the

initial search operations, the objectives need only be to identify the presence or absence of disease transmission in each suspect *village*. One or two questions to the chief and or a few other villagers can usually provide this information. In India, the Guinea-worm Eradication Programme conducted its first active search for guinea-worm in 1981 with a goal being to determine the number of villages where the infection occurred (ie, villages that had had at least one case of the disease within the last three years). A recognition card (picture or photograph of an ulcer with a protruding guinea-worm) was used to speed the interviews and increase the accuracy of the information gained. The search teams needed only a few minutes per village to identify 7533 affected villages. From population data available for these villages, 5.9 million people were determined to be at risk for disease.[17,25]

Subsequent search operations may seek to identify the number of *cases* of disease. Indian workers have performed annual house to house case searches in affected villages identified in the 1981 village search. When the first case search was completed in 1982, they found almost 43 000 victims.[19] In contrast, fewer than 550 cases of guinea-worm were passively reported for India in 1981.[25] Searches can thus serve as a basis for determining the degree of underreporting occurring in the passive system.

Active searches must be adjusted to the realities of available resources and conditions. The area to be covered is usually large, and the operation may profit from being linked with (ie, using resources available from) other projects. As long as the questions are kept to a minimum, active searches may utilize mobile government or donor personnel working in unrelated fields with little expenditure of their time and effort, and without interfering inordinately with their primary tasks. Boy scouts, local political organizations, railway workers, security forces, agricultural extension workers and community development personnel may also be approached. If financial constraints are great, searches may be geared to collect reconnaissance information from people representing a large surrounding geographical area (such as at markets, roadside gatherings, schools, etc).[10]

2) *Sample surveys* represent a form of active surveillance which provide detailed descriptive epidemiological data that are not needed for all cases, and which would require too much time to obtain for all endemic villages. Appropriate statistical techniques should be used to select a representative sample of villages to be visited by specially trained survey teams. Simple random, stratified random, cluster, or systematic sampling schemes (or a combined multi-staged procedure) should employ the most recent village listings and population determinations available through the census, taxpayers' rolls, mapping agencies, or other sources.[26] The sample might be taken from all villages, or may be chosen from among only those villages that have been reported to be affected through other surveillance mechanisms. In all instances, early consultation with a statistician is advisable. Within the village, household visits are the preferred method of data collection. A random direction cluster methodology (easier logistically in larger villages) or, in smaller villages, systematic survey of the entire village (eg, every fifth house) may be used.[20,26]

Data obtained from sample surveys may be used to calculate the following indices: 1) the estimated annual incidence (based on history of infection using local calendars and expressed as cases/1000, 10 000 or 100 000 people per year); 2) the point prevalence (based on the number of active cases observed at the time of the visit, and expressed as cases/1000, 10 000 or 100 000 people); 3) the proportion of villages affected; 4) the bodily distribution of lesions; 5) the average number of guinea-worms extracted or erupting per infected person per unit time; 6) the age and sex distribution of cases; 7) the duration of disability; 8) the seasonality of the disease (month of onset of worm eruption); 9) the type of water source(s) used; and, 10) the relative risk of infection associated with drinking water from these various sources. Results should be applied with caution to all the area from which the sample was drawn, given the variability of dracunculiasis incidence. However, such data are quite useful for measuring the impact of control measures.[20,27]

Quality Control

A proportion of the data collected through the various surveillance activities should be verified by knowledgeable health personnel. Individuals responsible for this verification may be selected from among independent workers, local supervisors, or upper level administrators. They should confirm a proportion of positive *and* negative reports by visiting a sample of health facilities, schools, or villages in endemic areas. Field verification has been shown to be critical to the collection of quality data from both active and passive systems.[7] In addition, quality of data may also be improved by requiring that signatures, marks and/or official stamps of the health worker, school teacher or village chief be placed on the appropriate report forms.

Research

Operations research is needed to select, adapt, and improve the methods and instruments to be used in surveillance data collection. However, investigators must be careful not to undertake research which cannot be promptly applied in programme implementation.[8] The most critical research needs are field-testing and sociocultural/language adjustment of techniques and questionnaires. The quality and usefulness of the data provided by the methods and instruments should be demonstrated before the investment is made in full-scale deployment. Evaluation of various surveillance methods may be achieved through their application, in an overlapping fashion, in one or two areas. Using active case searches as the 'gold standard' comparison, sensitivity, specificity, predictive values, and precision of the various techniques may be determined. Calibration and strengthening of the passive surveillance system can be one result of such research; another, the broad implementation of those supplemental techniques with the best performance in the prevailing conditions of the country.

FIGURE 1 *The approach to surveillance of dracunculiasis*

PHASE 1:

1. Determine geographical extent at the *village* level (village level searches)
2. Define the complexity and severity of dracunculiasis (sample surveys)
3. Strengthen passive surveillance mechanisms
4. Administer mailed surveys in health facilities, schools
5. Undertake validation missions
6. Analyse data and establish feedback loops
7. Review all available information and previous studies

PHASE 2:

1. Provide surveillance support of intervention activities (by case searches, survey, or sentinel methodology)
2. Evaluate and further strengthen passive surveillance mechanisms
3. Undertake validation missions of a percentage of positive and negative reports
4. Analyse data and maintain feedback loops
5. Administer annual mailed surveys (health facilities and/or schools)

PHASE 3:

1. Determine a nationwide *case* count by active search
2. Undertake market place and school searches
3. Validate *all* positive and a percentage of negative reports
4. Publicise the need to identify all cases
5. Provide rewards and incentives
6. Analyse data and maintain feedback loops
7. Evaluate and further strengthen passive surveillance mechanisms

PHASE 4:

1. Rely fully on passive surveillance mechanisms
2. Validate all positive reports and a percentage of negative reports
3. Provide rewards and incentives
4. Analyse data and maintain feedback loops

Progression of Surveillance Activities

The evolution of reporting activities in a national dracunculiasis eradication programme may be envisioned as encompassing four phases (Figure 1). In Phase 1, the surveillance system is geared to identify those communities in which guinea-worm disease is being transmitted. Ideally a national village search would provide a listing of *all* villages having local cases during the previous two years. This information would also serve to improve denominator data, allowing a more precise calculation of the population at risk.[3] Other surveillance activities in this phase would be to: 1) further refine the list of the affected village to include only those with active transmission sites (ie, eliminate those villages having just 'imported' cases); 2) classify affected villages by broad categories of water supply (ie, those with safe water supplies, unsafe, or both); 3) describe the severity of dracunculiasis in detailed sample surveys; 4) strengthen the reporting of dracunculiasis by the national passive surveillance mechanisms; 5) carry out 'mailed' questionnaire surveys, or hold (with specific surveillance goals in mind) a national meeting of health workers; and 6) undertake *validation/education field missions*. At the conclusion of Phase 1, health authorities should be able to accurately gauge the extent of the guinea-worm problem, and adjust the national programme according to regional needs.[28]

In Phase 2, the surveillance programme should stress support activities for the incipient elimination efforts. In those endemic regions of the country with intervention programmes, baseline case counts should be collected, and programme success followed by documentation of subsequent changes in the incidence and in the number of affected villages. In addition, authorities should use these data to identify and investigate those villages in which the control efforts are not producing the expected reduction of disease.

In Phase 3, as guinea-worm disease becomes a rare occurrence, the most important data category provided by surveillance activities is the actual number of cases occurring annually in the country. Systematic house to house case searches should be undertaken in formerly, or suspected, endemic areas. To certify national elimination, at least two consecutive case searches during the peak transmission season should yield no cases.[15,25] Market place and school searches, wide publicity, and rewards for confirmed reports can also be effectively used.[7,10] At the completion of Phase 3, the country is proclaimed 'Guinea-worm free.'

In the final phase, after dracunculiasis has been declared eliminated from the country, programme investment will taper, and along with it, active surveillance activities for dracunculiasis.[8] At this time, the passive system of surveillance must be well enough developed to detect promptly any reintroduction of the infection. Given the large populations of migrants who cross African borders, reinfection will remain a concern until neighbouring countries also eliminate dracunculiasis.[29]

In all phases, timely data analysis and 'feedback loop' activities should be used to stimulate interest in the eradication programme, inside and outside of the health system infrastructure. Field-based validation efforts are needed to maintain a reliable surveillance product, and in the third and fourth phases, follow-up and confirmation are needed for *all* positive reports or suspect cases. All available data should be submitted annually to: 1) national health authorities; 2) regional surveillance organizations (such as the Organization for Coordination and Cooperation in the Control of the Major Endemic Diseases (OCCGE), Organization for the Control of Endemic Diseases in Central Africa (OCEAC)); and, 3) WHO.*

Responsibility

A motivated, central-level health official should be assigned to develop surveillance activities by: 1) reviewing, correcting, and analysing official statistics for the previous five years; 2) collecting all published reports, theses and special studies on the subject that have been realized in the country; 3) implementing questionnaire surveys; 4) annually reporting new data, however incomplete, to the parties outlined above; and, 5) developing and evaluating the various components of the active and passive surveillance systems, including mechanisms for feedback loops. Technical assistance is available, upon request through WHO, to aid in developing these surveillance activities.

CONCLUSION

With national surveillance activities concentrated on guinea-worm disease in endemic areas of both Pakistan and India, the African continent is the last major region lacking programmes that monitor distribution and trends of incidence of dracunculiasis. Development of comprehensive surveillance programmes for dracunculiasis would challenge national authorities of the various endemic African countries to make detailed programmatic decisions within the broad outline suggested here. Only these authorities are in a position to consider, in accordance with the needs, conditions, and resources of their country, the "who, what, when, where, and how" required to establish and meet surveillance goals and priorities.[30-31] The conclusions resulting from these deliberations would ideally be incorporated in a written national plan of action against dracunculiasis.[1,5,31] The delegation of responsibility and authority (to the respective national institutions), training of personnel, unit organization, development of standard operating procedures (including the reporting pathway and level of data analysis), quality control, questionnaire design, field testing, and logistics are some important issues to be addressed in the surveillance section of such a plan.[32]

The initiation of a successful effort for global eradication of this ancient human affliction will be a great legacy of the International Drinking Water Supply and Sanitation Decade. In turn, the momentum from such a success should greatly promote future investment toward the ultimate goal of safe water for all. Improvement of surveillance in some African countries has already resulted in the stimulation of interest in the guinea-worm eradication effort by some national and international health authorities.[33] The continuing process needed for improving surveillance for dracunculiasis will undoubtedly strengthen surveillance systems, and develop the skills, needed in the struggle against other priority health problems as well.

*WHO requests that reports be submitted at least annually by the end of March.[21]

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Session 3

NATIONAL GUINEA WORM ERADICATION PROGRAMS AND ROLES FOR PEACE CORPS VOLUNTEERS *3 hours, 30 minutes*

Objectives

By the end of this session, participants will have

- described host country and international guinea worm eradication policies and programs,
- explained the role of multinational and bilateral agencies, such as the Peace Corps, in the eradication effort, and
- identified roles and responsibilities for individual Peace Corps volunteers within national and local guinea worm eradication programs.

Overview

During Session 3, participants will have an opportunity to meet representatives of agencies and organizations involved in the national and international guinea worm eradication effort. A representative of the national eradication task force should address the participants about what is currently happening in the country and specific areas where they are working. A panel composed of representatives of various agencies working on the guinea worm problem and water supply improvements should explain how its members are contributing to the national and local effort. In small groups, the trainees should identify guinea worm control activities that might fit into their job descriptions and local officials with whom they could collaborate.

Procedures

1. Introduction *10 minutes*

Display the session objectives on **Flipchart 3.1** for all participants to see. Briefly give an overview of the session and these objectives. Mention the guest speakers and panel members from government and other agencies who will be present for this session.

2. National Program Representative *50 minutes*

During this section it will be most desirable for a representative(s) of the national guinea worm eradication task force or comparable body to speak to the participants about the national program.

The following points should be covered:

- extent of the problem nationally
- organizational structure of the national program
- goals and target dates
- national, regional, and local strategies/plans
- program monitoring and surveillance systems
- health education activities

A handout **(Handout 3.1)** should be prepared locally that supports the items above and contains as much of the following information as available:

- outline of policies and program objectives
- national strategies and plan of action
- available surveillance report summaries
- organizational structure of the national eradication task force and state/regional/local bodies
- maps showing districts where guinea worm is endemic

Visual aids, such as sample posters from any educational programs, maps, graphs, slides of target communities, and the like, should be arranged in advance.

The speaker(s) should plan to talk for no more than 30 minutes and allow another 20 to 30 minutes for questions from the participants. One of the trainers should serve as moderator for the question-and-answer period to ensure compliance to time limits.

3. Collaborating Agency Panel *80 minutes*

Brief Lecture and Discussion

Introduce this topic in about 15 minutes with the aid of **Flipchart 3.2**, listing the various agencies below that are involved in international health and development and that have taken or are currently taking part in guinea worm eradication efforts. List only major (highlighted) headings shown below.

- **governmental agencies/ministries** (health, agriculture, rural development, education, water boards, etc.)
- **intergovernmental agencies:**
  - World Health Organization (WHO)
  - United Nations Development Program (UNDP)
  - United Nations Children's Fund (UNICEF)
  - World Bank
- **bilateral agencies:**
  - Water and Sanitation for Health Project, USAID
  - Vector Biology and Control Project, USAID
  - U.S. Centers for Disease Control
  - Japanese International Cooperation Agency
  - Danish International Development Agency
- **private voluntary agencies/nongovernmental organizations:**
  - World Neighbors
  - Rotary International
- **foundations:**
  - Global 2000, The Carter Center
- **universities/research institutes:**
  - University of California at Los Angeles, Danfa Project
  - University of Ibadan, Ibarapa Project
  - other national and foreign universities
- **international businesses:**
  - American Cyanamid Company
  - Du Pont/Precision Fabrics (filter cloth)
  - Georgia-Pacific (poster paper)

Ask the group to consider what category the Peace Corps fits in and why (i.e., bilateral).

Explain that these agencies have contributed in many ways, including those listed below and displayed on **Flipchart 3.3**.

- providing funds
- giving technical assistance
- training local personnel
- providing manpower
- conducting research
- donating materials and equipment
- gathering and exchanging information

Can participants list any additional agencies? This activity will lead to identification of the agencies working in the country.

Panel Presentation

Ideally, the agencies involved in any particular country should speak for themselves about their own roles. This should be presented as a panel discussion, which would run in total for about 45 minutes, with the time being divided equally among the participating agencies. Each speaker should take no more than 7 to 8 minutes, however.

The panel should have as a moderator one of the trainers. Fifteen minutes should be allowed for questions following the presentations.

It would be useful if each agency would provide in advance a one- or two-page summary of its guinea worm activities in-country and include contact addresses and the procedures by which the assistance of this agency can be obtained at the local level (if relevant). These summaries can then be made into handouts for the participants. Should a particular agency representative be unable to attend, at least the write-up could be presented.

Break

At this point a brief coffee break could be planned to allow participants time to talk with panel presenters.

4. Roles for Volunteers *60 minutes*

A major concern of the participants is whether they will actually have the time to undertake guinea worm control activities, and whether such activities fit legitimately into their job descriptions. They will want to know whether they should cooperate with ongoing plans, initiate action through local mobilization, or both. This section aims at resolving some of these issues through deliberations by the volunteers themselves.

Small Group Task

Volunteers have a variety of principal assignments: agriculture, community development, health, education, and so on. For this activity, they will be divided into groups according to these areas of work. Should one area be represented by only one or two participants, those people may join another group of their choosing. If one group is large (eight or more), divide it into two. (See "Trainer Notes" below on adapting this section for use with Peace Corps trainees who will be working exclusively with guinea worm eradication.)

Each group should have a trainer/Peace Corps staff member as a facilitator.

Display the following group tasks on **Flipchart 3.4.**

- Identify possible guinea worm control activities that would fit naturally into existing job descriptions.
- List local staff with whom one would naturally collaborate on guinea worm control.
- Complete the deliberations in 30 minutes.
- Prepare a brief (5-minute) summary of the deliberations to present to the larger gathering.

Facilitators should guide participants to mention their own ideas and encourage them to think how such tasks could fit normally into their daily activities. For example, with which community groups do they meet, could they talk to about guinea worm control? What surveillance information could they gather as part of their regular visits to homes and neighborhoods?

Participants should consider carefully their relationship with local health and development staff. Each facilitator should be given the following lists to help guide deliberations:

Possible Guinea Worm Control Activities

- health education of individuals and groups
- community mobilization for water supply improvements
- periodic household surveillance surveys
- assistance with clinic record monitoring and analysis
- observational studies of water contact behavior
- first aid for guinea worm victims
- monitoring distribution and use of cloth filters
- linking villagers with external resources

- preparation of reports to regional and national eradication task force leaders
- monitoring water supply use
- application of Abate to ponds
- assistance in training local volunteers
- coordinating activities among participating organizations

Local Government Workers and Volunteers

- medical assistants/dispensary attendants
- health inspectors
- public health nurses
- community development officers
- primary/village health workers
- agriculture extension agents
- schoolteachers
- adult education staff
- social mobilization volunteers
- works/roads/housing staff
- civil defense/police

Group Presentations and Discussion

Each group should now be given five minutes to present its deliberations. After all have presented, ask for comments on the similarities or differences in the roles envisioned by the different types of volunteers. Seek general opinions on the prospects and problems of being involved in guinea worm control.

5. Wrap-up *10 minutes*

Refer the group to the session objectives. Note that this session has started with the global level and worked down to the village level, where eradication must really take place.

Distribute **Handout 3.2**. Give participants a few minutes to read it. Ask them to consider how the experiences described relate to their own work generally and to the potential for their participation in guinea worm control.

Trainer Notes

- It would be ideal if the government and agency representatives could remain and have a snack or meal with the group to allow for more interaction and inquiry. A short break after the panel presentation may serve this purpose.
- Be sure to prepare handout materials on the program and encourage agencies involved in the program to prepare their own briefing sheets as handouts.
- Group discussion will be affected by the status of participants, that is, whether they are new in the country or whether they have been in the field for some time. If the former situation applies, it may be difficult for them to visualize potential roles. In this case an experienced Peace Corps staff member may have to use the small group time to explain the type of work that previous volunteers have done and how this might relate to guinea worm.
- If this training guide is being used for training volunteers who will be working exclusively on guinea worm eradication, the section on roles could focus on how they could mobilize inter-sectoral collaboration. Small groups might consider how other local workers, such as teachers, agriculture extension agents, community development staff, and so on, might be involved in the guinea worm effort.

Materials

Handouts

3.1 National Guinea Worm Eradication Program (trainers prepare)

3.2 PCV Roles in Health and Development

Prepared Flipcharts

3.1 Session Objectives

3.2 Small Group Task on Eradication

3.3 Agencies Involved in Guinea Worm Eradication

3.4 Small Group Task on Roles

Facilitator Guides

List of Guinea Worm Activities

List of Local Government Workers and Volunteers

Audiovisual Aids

Slides, posters, and projection equipment for national guinea worm eradication program presentation

NATIONAL GUINEA WORM ERADICATION PROGRAM

Trainers should prepare their own handouts for this part of the session. Include the following if available:

1. Organizational chart of the national eradication task force or appropriate body
2. Brief outline of national strategy/plan of action
3. Selected epidemiological and case search data
4. Maps showing districts where guinea worm is endemic

PCV ROLES IN HEALTH AND DEVELOPMENT

The following comments are taken from articles written by and about former Peace Corps volunteers concerning their participation in health and development work in general. You may wish to consider how these apply to your potential work in guinea worm control.

* * * * * * * * * * * * * * * * *

The few volunteers who learned to take it easy and to embrace the continual round of drinking and sociability [in Botswana] usually found this to be a resource rather than an impediment to the completion of their assignments. But the logic of this step remained counterintuitive for the majority of volunteers (Alverson, 1977).

Volunteers in authority roles are likely to accentuate the tendency...to inherit the mantle of authority of early colonial administrators and teachers (Cohn and Wood, 1985).

Volunteers should be taught to work with local conditions and available materials, not with transplanted technologies or programs (Rhoades, 1978).

In my interviews with more than 50 former and experienced current volunteers working in Botswana, I found that the majority had or were experiencing anxiety or puzzlement as a result of conflicts of values. Generally, the meanings the PCVs invested in the behavior they saw were based on simple, analogic reasoning: "X behavior would have such-and-such meaning to me if I were doing it, or if it were occurring in my culture, hence this must be its meaning for the Tswana." My investigations showed that neither physical deprivations nor exotic forms of behavior per se were seen by volunteers as irritations. Rather it was familiar behavior which had problematic meaning that most upset or puzzled the majority of PCVs (Alverson).

Although a sizable number of women are affected by Peace Corps programs, there are many more male recipients. More important, women tend to be particularly underrepresented in those programs most likely to involve the transfer of marketable skills and resources. It is male volunteers and recipients who tend to be engaged in such programs, while female volunteers are more likely to be engaged in providing services (e.g., health and nutritional information), primarily to women (Cohn and Wood).

Despite the lack of any concrete success, we struggled ahead, clinging to the naive notion that if it works for us then it should work for the Nepali farmer as well. Nevertheless, over time we realized that a major psychological blow had been delivered: the actual "grass roots" experience ran counter to the image on the Peace Corps recruiting poster. Bright-eyed natives did not stand in awe of our "better methods, higher crop yield, disease prevention, self-reliance"; in fact, our Western development programs seemed to fit like a square peg in a round hole. Unfortunately, we did not question our own activity, but rather blamed our failure on the host country nationals (Rhoades).

Faced with confusion, many volunteers are tempted to provide or express interpretations which often reflect their anguish rather than any serious effort to understand the Tswana. Such well-known rationalizations as: "they're just lazy," "they have no confidence," "they're irrational," "they don't understand time," etc. were frequently encountered... For example, if a volunteer gives instructions to a group of workers concerning a chore they must do, the salient feature of this episode for the Tswana is to discuss the details of the assignment, its implications, its significance, its ramifications. This may take half-an-hour. The volunteer is dumbfounded that people would "stand around bullshitting" about their work while "time is being lost." The Tswana will do the job; but if it is not completed that day, tomorrow is still another day, and the world will still be here in exactly the same shape it is now... In short, volunteers often fail to understand social actions signaled by the behavior they see [in terms] other than those already fixed in their consciousness (Alverson).

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Session 4

COMMUNITY ASSESSMENT — *2 hours, 40 minutes*

Objectives

At the end of this session, participants will have

- defined the components of a community assessment for guinea worm control,
- explained the use of community assessment in planning a local guinea worm control program,
- described the methods used to gather information needed to conduct a community assessment, and
- indicated the benefits accrued by involving the community in its own assessment.

Overview

After reviewing the session's objectives, the trainer stresses the importance of the role of the community in helping to eliminate guinea worm and the necessity for collecting reliable information and data. A brainstorming exercise by the large group elicits the various types of information needed; in small groups the participants, referring to the case study, begin to collect information about the fictitious Apata Village. A brief lecture explains the different data gathering methods, and the participants are asked to match type of data with appropriate collection methods. In the large group, the trainer leads a discussion on community involvement in data gathering and analysis and why it is valuable to have community members participate in this effort.

Procedures

1. Introduction — ***10 minutes***

Briefly describe the purpose of the session by displaying the session objectives on **Flipchart 4.1.**

Inform participants that unlike diseases that have a technological "quick fix" (e.g., a vaccine), guinea worm is complicated by many human behavioral, social, economic, political, and geographical issues. One cannot improve a community water supply without the full understanding, permission, and collaboration of the community. One cannot force people to develop the habit of daily water filtration, but instead must encourage this new behavior in the context of existing beliefs and social relationships. In order to eliminate guinea worm, a community must take full charge of local action.

Emphasize that the concern here will be on collecting information using qualitative methods to gain an in-depth picture of the community. PCVs are unlikely to have the time to undertake formal research on guinea worm. Qualitative methods will stress the natural opportunities for gathering data during normal work and social interaction.

2. Type of Information Needed *60 minutes*

Brainstorming Exercise

Engage the group in brainstorming about the type of information needed about the community to plan guinea worm control. (Note that much of this information will be valuable for planning other community activities, too.) Record answers on a flipchart.

Wait to debate or discuss answers until all ideas have been recorded. Then go through the list one item at a time and ask group members why that particular piece of information is needed. Examples of items and reasons are listed in **Handout 4.1**. Make sure they are added to the list if participants do not mention them.

Small Group Tasks

Now divide the participants into small groups. Display the following group tasks on **Flipchart 4.2**.

- Review the Apata Village case study.
- Identify all the items listed above using Handout 4.1 as a guide.
- List separately which information is available and which still needs to be collected in Apata.
- Complete discussion in 30 minutes.

Return to the large group. On flipchart paper, first list the information about Apata Village that is available from the case study. Discuss the value of this information in relation to understanding the guinea worm problem and the community in general.

On a second page of flipchart paper list information that was not contained in the case study but that group members think would be necessary to collect. Ask the group to discuss why this additional information would be needed.

3. Community Assessment Methods *40 minutes*

Brief Lecture

Distribute **Handout 4.2** on data gathering methods and go through it with the participants in the form of a brief explanatory lecture. Emphasize that these are commonsense methods, but they are also quite valid because they aim at gaining an in-depth view of the community.

Explain that much data can be gathered about a community through participant observation, that is, by being an active, but quite aware, member of the community. PCVs, by the nature of their work, are already participants in community life. Their task is to heighten their observation skills to learn about the problems, social relations, and beliefs of the people around them.

Refer participants again to Handout 4.1 and ask them to match the types of data needed with appropriate data collection methods from Handout 4.2. Display **Flipchart 4.3**, which lists only the "Types of Information" column seen below. Record answers on data collection methods in the right-hand column. The following are examples of sample answers.

TYPES OF INFORMATION	DATA COLLECTION METHOD
Local Leaders	Informal Conversation
Community Structure	Participant Observation
Social Groups	Interview Guide
Income Factors	Open-ended Interview
Beliefs	Focus Group Interview

Note that there usually is more than one way to gather data and that therefore the right-hand column may contain several ideas for each type of information needed.

Question the participants about how they would ensure that the methods they suggest would guarantee truthful, accurate, and reliable data. In the discussion, emphasize that using a variety of methods to collect information will ensure a more accurate picture. Also, seeking information from several sources, i.e., not relying on a few people, will provide a better picture of the overall community and its needs.

4. Community Involvement *30 minutes*

Post the following statements on **Flipchart 4.4**:

Awareness of a problem is one of the first conditions for solving that problem.

Awareness that a problem can actually be solved is second.

Ask participants to apply these statements to the Apata Village case study and to the situation in their own villages.

- Do people believe guinea worm is a problem?
- Do they rank it as a serious problem?
- Do they believe guinea worm can be prevented—that is, do they think the problem can be solved?
- Do they believe they have the power to solve the problem?

Note that health workers are always telling people that the guinea worm problem can be solved, but still people may not perceive that a solution exists. Seek ideas from the group about why this is the case.

Summarize by explaining the following:

- When other people define your problems for you, you may not always accept or believe the solution.
- Projects often fail (i.e., are not maintained) because these were proposed by an external agent/worker and the community feels no sense of "ownership" in or commitment to the project.
- People may perceive that there are more pressing needs than the one that the health/community worker feels is most important.
- Because of previous political promises, people may believe that government should provide water supply and other amenities and, therefore, are less willing to undertake suggestions for self-help.
- When a problem, like guinea worm, has been with people since the time of their ancestors, they find it hard to believe that a solution exists.

One way to overcome these roadblocks to community action is to involve people in the villages where we work in the study or assessment of their community. In this way they not only get a full perspective on specific problems and possible causes but, also, may identify potential solutions using local resources and see the interconnectedness of a variety of community needs and problems.

Lead a discussion on community involvement in data gathering. Refer the group again to the topics in Handout 4.1 and the methods in Handout 4.2 as well as the items listed on Flipchart

4.3. Ask for ideas on how and who among members of the community can be involved in collecting *and* analyzing information about guinea worm. List responses on flipchart paper. Examples of answers would be

- community leaders can help identify water sources
- women's group leaders can help interview members about water collection practices
- schoolchildren can help observe water contact behavior
- teachers can help analyze school attendance data
- local volunteers can help with household surveys

Encourage the group to think of reasons why this involvement would be valuable (e.g., generating awareness and commitment). Ask members to share their own experiences in self-study and creating self-awareness with individuals, groups, and communities. Emphasize that we as community health/development workers must be willing to LISTEN AND LEARN from community members for such involvement to succeed. Note that this is not a skill possessed by many local health/development staff at present, but is something that Peace Corps volunteers can model as a desirable behavior.

5. Mapping Local Knowledge — *10 minutes*

Refer participants to the map of Apata Village attached to their case study and display a larger version as **Flipchart 4.5**. Ask participants to locate various points of economic, political, social, and health interest. Explain that maps are useful for understanding social and economic relations in the community as well as for targeting various health and social problem areas. Note how the map makes it easier to visualize the combination of rocky terrain, lack of safe water supply, and higher prevalence of guinea worm in the northern ward of Apata. Access to education and modern health care for people in the southern part of the village is also more easily seen when the information is presented on a map.

Explain that village self-study is enhanced by use of maps. In fact, the villagers can construct their own map. They can gather in the market square or at the local school and, using sticks, stones, cans, boxes, and whatever is available, make up a small-scale version of the village where all can see. The community worker (or Peace Corps volunteer) can guide discussion among the community members about what significance they see in the map and the arrangements and relations depicted therein. This often leads to greater social, political, and health awareness.

6. **Wrap-up** ***10 minutes***

Review the session objectives.

Explain that it is not possible in this short workshop to train the participants in all data gathering methods, but that the session has served to focus their attention on what is available. Ask the participants to reflect on community assessment methods they might use at home. What seems most appropriate? Realistic? They might want to record some of these thoughts on the data gathering process on flipchart paper.

Provide a bridge to the next session by explaining that during the study of surveillance, there will be opportunities to develop and maybe try out some of the different quantitative (survey) and qualitative methods.

Materials

Handouts

4.1 Community Assessment Data

4.2 Qualitative Data Collection Methods

Prepared Flipcharts

4.1 Session Objectives

4.2 Small Group Tasks

4.3 Types of Data and Appropriate Collection Methods

4.4 Awareness of Community Problems

4.5 Sketch Map of Apata Village

COMMUNITY ASSESSMENT DATA

- **Local leaders**—formal and informal (leaders are essential for mobilizing community support of and participation in a project)
- **Community structure**, wards, ethnic groups, social classes (even a small community may not be homogeneous and problems like guinea worm may vary by section or group; also, effective community involvement should consider all natural divisions within the community)
- **Social groups**, organizations, clubs, societies (social groups are mechanisms for reaching specific segments of the community—youth, women, etc.)
- **Social institutions**—religious, educational, etc. (formal institutions have access to resources and provide communication channels for program promotion)
- **Income** level, occupation, quality of housing, major possessions, such as motorcycles (these are indicators of the resources the community may have to devote to projects like improved water supply)
- **History** of past and current community projects (evidence that the community can work together to solve problems)
- **Attitudes** toward government agencies, health care, community cooperation, etc.
- **Beliefs** about guinea worm—cause, prevention, treatment (these may indicate how willing people may be to adopt new ways and how well existing ideas overlap scientific thought)
- **Water sources** and treatment practices (this gets to the heart of the guinea worm problem and indicates who and how many people have access to safe water and whether they use existing sources in a safe or unsafe way)

QUALITATIVE DATA COLLECTION METHODS

Interviews

> "The purpose of interviewing is to find out what is in and on someone else's mind. The purpose of open-ended interviewing is not to put things in someone's mind (for example, the interviewer's preconceived categories for organizing the world) but to access the perspective of the person being interviewed."
>
> Michael Quinn Patton

The interview methods described below are not mutually exclusive but represent a gradual process of community study building from the general to the specific.

The Informal Conversational Interview

This is the most open-ended and flexible form of interviewing. Most questions flow from the immediate context and situation. There is no predetermined set of questions. In-depth information is thus gathered in the natural flow of social interaction because respondents feel at ease.

This approach takes time and depends on the interviewer's conversational skills, but it is a good starting point to get ideas and orientation for later, more formal interviews.

The Interview Guide

The guide consists of a list of issues that are to be explored during the course of an interview. It is prepared to ensure that the same basic topics are covered by each interviewer with each respondent. The guide provides a framework, but is not a prescription for the exact ordering and structure of questions. The interviewer is encouraged to adopt a natural conversational style, while focusing the interaction on the topics, and to follow through with probes to expand on responses.

This approach is particularly valuable for gathering information from a few key informants on the different ways people think about an issue, and thus makes it easier to develop a more culturally appropriate and specific set of questions for later standardized interviewing.

An interview guide about guinea worm might contain the following issues:

1. **People's beliefs about the cause of guinea worm**—why some people get it and others don't; who is most susceptible and when; natural and supernatural ideas;

general community ideas versus individual respondents' personal views; factors associated with cause: time of year, type of diet, etc.

2. **Recognition**—early signs; how to distinguish guinea worm from other diseases; sequence of signs; how to know when it is time to get help/treatment.
3. **Prevention**—whether guinea worm is preventable; local ideas; what is remembered from health worker advice; examples of successful preventive measures; preference for preventive measures and reasons.
4. **Treatment**—traditional remedies; efficacy of remedies; belief that the disease can be cured; thoughts about modern medicine and guinea worm.
5. **Seriousness**—opinions about whether guinea worm is a serious disease and why; seriousness relative to other common diseases; examples of seriousness.

The Standardized or Formal Open-ended Interview

In this case the interview questions are written out in exactly the way they should be asked during the interview. Careful consideration is given to wording to minimize any controversy that may arise between interviewees and interviewers. The result is a highly focused interview that is valuable for baseline data gathering and subsequent program evaluation. Standardization makes data analysis much easier.

Examples of an open-ended question with follow-up probes are

- How do people in this community usually treat guinea worm?
- Do you know the ingredients of any of the local medicines?
- How effective are the different local medicines?
- What might encourage someone to seek treatment for guinea worm at the health center?

Focus Group Interviews

Focus group interviews are exploratory sessions among 6 to 12 people who are guided by a facilitator to talk freely and spontaneously about topics being studied. Focus groups serve a similar purpose as in-depth and open-ended interviews, with individual key informants using an interview guide to help draw out the general scope of beliefs and opinions in the community at large. They are not to be used to count the number of people who believe a certain thing, but to give a picture of the type of beliefs common in the community.

The facilitator uses a list of open-ended questions with suggested follow-up probe questions. The facilitator does not interject his or her own opinions or ideas. A recorder is present to take notes not only on the specific words spoken but also on the nuances, nonverbal communication, and social interaction within the group that might point to underlying feelings about the topic under discussion.

In order to encourage free flow of conversation within the group, members should be somewhat homogeneous. A mixture of elders and youths, for example, would likely inhibit some people from talking. Consequently, it will likely be necessary to organize several focus group discussions based around the various subgroups a program may target.

Information gathered through key informant interviews and focus groups is often called "formative" data in the sense that it helps identify the needs and targets for formulating program strategies.

Observation

> "The purpose of observational data is to describe the setting that was observed, the activities that took place in that setting, the people who participated in those activities, and the meanings of what was observed from the perspective of those observed. The descriptions must be factual, accurate, and thorough, without being cluttered by irrelevant minutiae and trivia. The basic criterion to apply in judging a recorded observation is whether that observation permits the reader to enter and understand the situation described."
>
> Michael Quinn Patton

Participant Observation

When the researcher places himself or herself in the position of a functioning member of a social group, organization, agency, community, or institution, even if temporarily, participant observation can take place. This requires that the researcher maintain a level of awareness that allows him or her to note (and subsequently record) important activities, relationships, events, processes, or even the lack of these as part of data that will foster understanding of the community.

A participant observer can tell how and why certain decisions were made, who the prime movers were, who resisted, who took responsibility, what resources were available, in what order action steps were taken, and reasons people gave for the observed action and consequences of this action. Daily life events and procedures can be observed by the researcher who has taken up full residence in the community. In short, the participant observer is able to learn how and why things work in a community.

Structured or Purposeful Observation

While the participant observer approach provides a general and ongoing picture of the community, it may be necessary in planning and evaluating a program to plan intentional, structured observation. An example of this is observation of water contact and use. This would require the observer to place himself or herself in a particular location (in this example the village pond) for some period of time (i.e., long enough to observe the normal variation of activities) and make note of a specific and predetermined set of observations.

Examples of items to observe may include

- Who comes to the pond: age, sex, occupation, etc.?
- What do they do in the pond: wash, bathe, fish, etc.?
- What parts of their body are submerged in the water and for how long?
- How and where do they enter the pond: Is there a specific entrance; is there a step or rock; are there barriers?
- If they collect water, how much?
- What activities go on around the pond—clothes washing, soap making, growing vegetables, etc.?
- What is the observed quality of the water at different times?
- Are any rules of usage observed? If so who enforces them?
- Do people come individually or in groups?

Documents and Records

Today documents and records exist in almost every sizable community and may be found at clinics, schools, agriculture extension offices, private businesses, city halls, religious institutions, and among officers of various community organizations. This information is most valuable in tracing events and trends over time. It can be used to confirm and even contrast oral and observed data.

But just because written sources exist does not mean one may have ready access to them. There may be legal requirements associated with public documents. More important, people may be protective of records because it may be perceived, correctly or not, that such information may have a deleterious effect if it gets into "the wrong hands." In short, guardians of records are often extremely protective of the written word.

An example of the value of "triangulating" other sources of data with documents can be seen in the case of guinea worm. People may respond in an interview that they feel that Western medicine offers no help for a guinea worm victim. Observation may show that not only do many people in a household have open guinea worm ulcers, but that they apply various herbal ointments to the affected area. Finally, a review of clinic records may reveal that few people even go to a clinic complaining of guinea worm.

In this case the three methods confirmed one another, but it is just as valuable to learn where divergences exist. If respondents had simply wanted to be nice to the interviewer and say that clinic treatment was best for guinea worm, the records would help pinpoint this inconsistency and show the interviewers that they had not carefully probed to learn the full picture.

References

Patton, M.Q. 1990. Qualitative Evaluation and Research Methods. 1990. Newbury Park, Calif. Sage Publications.

Scrimshaw, S.C.M. and E. Hurtado. 1987. Rapid Assessment Procedures for Nutrition and Primary Care: Anthropological Approaches to Improving Program Effectiveness. 1987. Los Angeles: UCLA Latin American Center Publications.

Session **5**

SURVEILLANCE: DEFINITIONS AND PROCEDURES

7 hours, 45 minutes

Objectives

By the end of this session, participants will have

- defined surveillance of infectious diseases,
- stated a clear case definition of guinea worm,
- differentiated between active and passive surveillance,
- described specific surveillance methods, including case searches, clinic record reviews, and village-based monthly surveillance,
- analyzed, graphed, and interpreted results from clinic records, surveillance surveys, and monthly searches, and
- explained how to conduct an observational study of water contact behavior.

Overview

This session focuses on the concept of surveillance: its definition and procedures. During the introduction, the trainer will review the session's objectives and explain that the session will include theoretical preparation for field work (time permitting) or for simulated planning using the case study. After individually defining "surveillance," the participants are to meet in small groups and then in the large group to agree on a common definition. The discussion should continue on the subject of a standard case definition for guinea worm and why it is important to have one case definition on which all agree.

During a brief lecture, three major methods of surveillance will be explained (clinic record analysis, case search survey, and village-based monthly surveillance) and procedures for use reviewed. The group will also be exposed to the rationale and procedure for studying water contact behavior in the community as a basis for planning and evaluating health education activities.

In small groups, the participants will have an opportunity to analyze, interpret, and graph sample surveillance data based on the case study. The session closes with emphasis on the need to develop data management skills at the local level and the use of data for planning.

Note that the trainers have the option of emphasizing sections of this module that are most relevant to the stage of eradication/surveillance activity in their country at present. This means that the time actually used for this session will vary according to local needs.

Procedures

1. Introduction *5 minutes*

Display the session objectives on **Flipchart 5.1**. Explain that this session reviews methods for gathering data on the guinea worm situation in a community, region, or nation. Note that such data is needed for proper planning and eventual evaluation (i.e., certification that guinea worm has been eradicated). Tell participants that they will have an opportunity to analyze prototype surveillance data based on the Apata Village case study.

2. Defining Surveillance *50 minutes*

Individual Task

Give instructions to participants as follows:

- Write a brief definition of "surveillance in disease control programs" on a sheet of paper. These will not be collected.
- Definitions do not have to be perfect.
- Take no more than five minutes.

Small Group Task

Next, group the participants in three or four groups of approximately six members each. Display the tasks for the groups on **Flipchart 5.2**.

- Develop one composite definition from the individual ideas.
- Write the group definition on flipchart paper.
- Post the flipcharts when finished.
- Take no more than 20 minutes to complete this task.

Group Presentation and Discussion

When all the definitions are posted, have each group present its definition in no more than five minutes each. Note similarities and differences among definitions. Through discussion develop a consensus definition. Write this final definition on flipchart paper.

Now give each participant **Handout 5.1**, which offers three definitions. Compare these with the final group definition.

Finally, review the following discussion questions:

- At what point(s) in a disease control program is surveillance relevant/needed? planning, implementation, evaluation? Why?
- How is surveillance similar to and different from program monitoring? Distinguish between implementation of activities and measuring outcomes.
- Who should be responsible for conducting surveillance? What would be the roles of health workers, staff of other agencies, community leaders, community members?
- When would be the ideal time(s) of year to conduct surveillance for guinea worm? Consider the transmission cycle and the length of time before one can expect to observe any impact from implementation.

Be sure that participants conclude that surveillance of infectious diseases is an essential ongoing component of any disease control or eradication program. Surveillance establishes a baseline that can be used to target communities. Regular surveillance activities help monitor program progress. Continued surveillance is needed to document program outcome; in this case, no guinea worm cases occurred in the target areas over two seasons.

3. Guinea Worm Case Definition *15 minutes*

Explain that accurate surveillance requires a clear definition of how the disease appears, and that all people involved in surveillance must agree on this case definition. This section, therefore, is geared to provide concepts and tools of guinea worm case definition.

Post the following Centers for Disease Control case definition on **Flipchart 5.3**:

A case of dracunculiasis is defined as a person exhibiting or having a history of a skin lesion with emergence of a guinea worm (the parasite *Dracunculus medinensis*).

Ask the following discussion questions:

- Why is it necessary to have one standard case definition?
- Why is it important to include "... with the emergence ..." ?

- What is meant by "history"; that is, with how long a period should we be concerned? How does length of time relate to determining whether the disease has been eliminated? How long do people remember reliably?
- Do our definitions match the community's own definition of a case of guinea worm (e.g., in Apata Village)?

Refer to the case study and the Apata people's ideas about guinea worm. Review from the first day's discussion the kind of problems that can arise if community members and health workers have different ideas about a disease.

4. Surveillance Methods *30 minutes*

Review from the definitions just discussed that surveillance involves collecting the following information, as displayed on **Flipchart 5.4**:

- **who** has or has had the disease
- **when** they had it
- **where** they live or work

Note also that there are three main ways to gather the information needed, as seen on **Flipchart 5.5**:

- **ask** people directly (interview)
- **observe** people in the community
- review **records** and documents

Use the case study to discuss as a group how and where one might gather information in Apata for guinea worm surveillance. What problems might arise? Which sources of information would be more or less reliable, and why? In particular, discuss the possible differences between clinic records, direct observation, and interview questions. How is the situation in the villages where the participants work similar to or different from that in Apata?

Based on this discussion introduce the concepts of active and passive surveillance. Post **Flipchart 5.6** and discuss the following definitions derived from Mausner and Kramer (*Epidemiology—An Introductory Text*. 1985. Philadelphia: W. B. Saunders Company, 295-296):

> **Active surveillance** is the collection of data, usually on occurrence *and* absence of a specific disease, for a relatively limited period of time at regular intervals (e.g., monthly, annually) through outreach on the part of health personnel.
>
> **Passive surveillance** refers to data generated without solicitation or intervention by health agency staff and includes information gathered through official recording

and reporting systems of clinics, laboratories, workplaces, schools, and other institutions.

Explain that the remainder of the session will be devoted to examining four specific surveillance methods:

- analysis of clinic records
- case search surveys
- monthly surveillance with village-based workers
- observational study/water contact behavior

5. Analyzing Clinic Records *60 minutes*

Small Group Activity

Distribute **Handout 5.3**, Extracts from Apata Clinic Records. Participants should return to their small groups. Post guiding questions and tasks for analyzing the information on **Flipchart 5.7**.

- How many cases of guinea worm were treated at Apata Dispensary during the period? Use the clinic data summary sheets. What proportion of total patients had guinea worm?
- What is the age and sex distribution of cases? Draw a pie chart on flipchart paper that shows the proportion of preschool, school age, and adult patients with guinea worm.
- Can any conclusions about geographical distribution of cases be made? Draw a bar chart on flipchart paper showing the number of cases by ward.
- Are these results a likely reflection of the true situation in the community? Why or why not?
- What problems are observed with these records?
- Complete this task in 30 minutes.

Distribute **Handout 5.4**, Clinic Data Summary Forms, to aid groups in completing their task. Make sure each group has a hand calculator, graph paper, and colored pencils.

Discussion Session

When groups have completed the task, post the graphs and discuss each question. The following points should arise:

- It is difficult to determine the exact number of cases because the health worker records the same patient more than once when he or she comes back for dressing. This shows a need to distinguish between "new" and "old" cases when recording and reporting.
- There may be problems of accuracy in recording names, ages, sex, address, etc., that inhibit full analysis of data. This is evidence of a need for training in record-keeping by health workers.
- We cannot be sure if some of the ulcers treated were not guinea worm ulcers. That is, we are not sure whether the health worker is using the correct case definition.
- Though address/ward is not recorded for all patients, one does see a preponderance of people from North Ward. Note that it is unlikely that every guinea worm victim seeks care at the dispensary. Therefore, we do not know the total number of cases in any given ward and cannot say which ward has the highest prevalence. What is of most value is that the records are a starting point to tell us in which wards or areas guinea worm is endemic and where more detailed case search is needed.

Encourage the group to think of how the findings from clinic records, alone or in conjunction with other data, will be useful in conducting surveillance and program monitoring. Such ideas include the following:

- Surveys rely on "reports" of what people have done or might do when ill. Clinic records document who actually uses services and allow us to distinguish the type of people (e.g., adults versus children) most likely to seek care at a clinic for guinea worm.
- Address information helps us learn about accessibility.

Remind participants that useful data can also be gathered from schools. Monthly absentee figures can be compared with the guinea worm transmission season to look for trends. Some schools may even know and record the reasons for absence.

Finally, note that all data gathered from records must be kept in strictest confidence. For this reason, clinics and schools may be reluctant to allow just anyone to have access to their records. Therefore, participants must work in collaboration with local guinea worm eradication task force members and community leaders.

6. Case Search Surveys *80 minutes*

Brief Lecture

Explain that the household case search survey is a major form of active community surveillance and provides a baseline for planning and evaluation. Display the following on **Flipchart 5.8** and discuss the process and use of surveys:

- Case search surveys are often conducted annually.
- Surveys are used initially to determine the extent of guinea worm.
- From these initial surveys, villages in which the disease is endemic are targeted.
- Subsequent surveys focus on the target villages to determine program progress.
- Finally, surveys are used to document the eventual elimination of the disease.

Group Brainstorming

Comment that an important step in planning surveys is to develop the survey instrument or questionnaire. Emphasize that people are busy and will not be willing to spend a long time answering a questionnaire.

Each participant should be asked to list quickly on a sheet of paper five or six essential items about guinea worm that should be included on the household questionnaire.

When each individual has finished writing, use a flipchart or chalkboard to record all the items listed by each participant. Do not discuss the items until all nonrepetitive items have been listed.

Guide discussion to pinpoint the most important items from the larger list, bearing in mind that the final list should be short. Use a different color marker to highlight these items. Later, transfer these items to a clean flipchart page. These items should include the following:

- Basic household demographics—age, sex, occupation of all residents.
- History of guinea worm for each member based on national case definition—most probably within the past year.
- Nature of guinea worm infection—month when worms first emerged, total number of worms, any disability.
- Household water source (pond, well, etc.) and water treatment practices (filtering, sedimentation, etc.).
- Beliefs about guinea worm.

Distribute **Handout 5.5**, which contains a prototype case search survey form. If a recent guinea worm case search has been completed in your country, also obtain copies of those forms and distribute them. Ask the group to compare the list it generated with the prototype forms.

- What improvements could be made in the prototype forms?
- What information did group members leave out of their own list?

Group Discussion

On **Flipchart 5.9** display questions for use in critiquing the survey instruments. Ask the group to review its list and the prototype forms and suggest improvements.

- Is the wording of questions simple?
- Are any questions ambiguous?
- Can the concepts be easily understood?
- Are there any culturally sensitive or offensive questions?
- Will these questions (and the concepts they contain) be easy to translate into local languages?
- Is the number of questions adequate or too many?
- Is the form designed in a way that is easy for interviewers (e.g., local health workers) to use?
- Are the form's instructions to interviewers adequate?

Explain that one would ideally pretest any questionnaire with a small number of people who have characteristics similar to those of the target population to make sure the instrument works as intended.

Note also that interviewers need to be trained properly before going out in the community to administer a questionnaire. Training includes careful explanation of the nature and purpose of the survey and practice sessions.

7. Defining and Identifying Households *20 minutes*

Brief Lecture

Indicate that a standard definition of a household, our basic unit of study, is very important. When administering the household survey form, interviewers must know who to include as members of a given household. Display the following possible definitions of "household" on **Flipchart 5.10**:

- People living under the same roof

- People eating from a common pot
- People sharing economic resources
- People related by blood and/or marriage

Ask participants to consider how the definition of a household differs between Africa and North America. From their own experience, what definition of household seems appropriate in the villages where they work?

Remind them that even in North America there are difficulties because single-parent families and various living-in arrangements have been added to the "traditional" nuclear family in recent years.

In Africa, there are certainly some nuclear families, but there are also intergenerational families, polygynous families, and extended families (brothers and cousins and their wives and children all live in the same compound). Because of migration to find employment, some families may have members who are not physically present during most of the year, but who are still considered central to that family's definition due to their financial contributions.

Note that the practical concern during a village survey is that an interviewer cannot hope to question every single resident. Convenience dictates, therefore, that one member, designated "head of household," give proxy reports about the others (in this case, be able to state their ages and whether they had guinea worm in the past year). If the household is very large, this proxy reporter may not easily recall information about every member. Also, proxy reporters may be reluctant to give out information on other people in the house aside from their immediate kin.

It may be most convenient for the purposes of this exercise to use husband-wife (wives)-children as a basic study unit. With this definition, one may find more than one household per dwelling.

Another basic question is, "Who is the head of household?" In traditional societies it is usually the father or eldest male. Again, in practical terms, one does not always find this person at home. Therefore, one may either come back later in hopes of finding the head of household or inquire whether the wife or another reliable person is willing to respond for the family.

Another practical reality is that while one may identify and interview the head of household, the inquiry may take the form of a group interview because other members may be present and help provide more detailed information if the head cannot remember.

Note: A lunch break would be appropriate at this time.

8. Analyzing Survey Results *50 minutes*

In this section we will work with results of an active surveillance survey based on the case study. On **Flipchart 5.11**, post the following information:

Table 2

Preliminary Surveillance Results:
A Survey of Dracunculiasis in Apata Village

Section/Group	Number of Cases
North Ward	410
South Ward	360
New Ward	80
Males	430
Females	420
Preschool Children	25
School-age Children	300
Adults	510
Senior Citizens	15
Total	**2,550**

Explain to the participants that this represents early results of a study by a university research team, conducted near the end of the last dry season. The team visited 400 heads of household (about 95 percent of the total) in all sections of Apata and asked about the number of cases occurring in the previous year. Note that the researchers did not visit the more remote farm hamlets.

<u>Small Group Exercise</u>

Divide participants into their small groups. Tell them they have 30 minutes to analyze the rough data from the survey by answering the following questions, which should be posted on **Flipchart 5.12**:

1. What was the overall prevalence (percentage) of guinea worm in Apata during the last year?
2. Are there differences in prevalence by age, sex, and area of residence? Display these differences graphically in bar charts.
3. What other demographic or descriptive information do you think would be valuable for a surveillance study of this community?
4. What are the implications for an eradication program based on these preliminary findings?
5. How do the lessons we learn from this data differ from those of the clinic record analysis?

Remind the groups to refer to the Apata case study handout. Distribute **Handout 5.6**, which shows examples of how national case search data has been presented graphically to aid understanding and targeting of our resources.

Ask the groups to write their answers to the first two questions on flipchart paper and post these when finished.

Group Presentation and Discussion

Each group should be given five minutes to present its results.

Note that the age groupings mentioned above do not exactly correspond with the census sheet attached to the case study. How did groups tackle this problem?

Lead discussion to identify other needed information (question three from Flipchart 5.12), for example, prevalence as it relates to religion, level of education (though this might also be indicated by residence), source of drinking water, and beliefs about guinea worm.

The findings imply that certain sections of the community may be at higher risk of contracting guinea worm. Discuss the important gap in information about the surrounding farm hamlets. What may be some of the logistical problems associated with getting data from these areas? How can these problems be overcome?

The groups should also discuss the possible reasons for age variation, but little or no sex difference in prevalence.

Conclude by asking what are some program implications of these findings. The concept of targeting different interventions to different segments of the community should arise from the discussion.

9. Monthly Village-based Surveillance *60 minutes*

Brief Lecture

Explain that as an eradication program proceeds, accurate and timely information is needed to monitor progress and target problem areas quickly. One way to achieve ongoing surveillance reporting is to train village volunteers. Involving villagers in the surveillance and eradication effort is a means of integrating guinea worm programs with primary health care. Post the following essential services of primary health care on **Flipchart 5.13**:

- Health Education
- Maternal and Child Health (including family planning)
- Control of Endemic Diseases
- Water Supply and Sanitation
- Treatment of Common Illnesses and Injuries
- Nutrition and Food Supply
- Essential Drug Supply
- Immunization Services
- Mental Health

Point out that guinea worm disease is endemic and is a common illness that needs first aid. Additionally, as noted in Session 2, guinea worm disability has a disproportionate impact on the health of mothers and children.

Stress that eradication of the disease requires health education and that the disease can be solved through provision of safe water supplies. The services listed on Flipchart 5.13 can and should be provided through self-help, often through the efforts of volunteer village health workers. Note that in the spirit of primary health care, villagers must choose their own volunteers, in this case guinea worm reporters (also called village-based workers or guinea worm scouts).

Group Brainstorming

Ask the group to consider who would be the best type of person from the village to undertake this volunteer work. Record all ideas on flipchart paper. The following suggested criteria should be among the ideas raised:

- a permanent resident of the village
- someone respected by all villagers
- a mature person (demonstrated possibly by age or marriage)

- someone who has demonstrated previously a willingness to help others
- an articulate person who can communicate well with fellow villagers
- if possible, someone literate in the local language

Note clearly that while ideas like those listed above are good in theory, it is ultimately up to the villagers to set the criteria and choose someone they want.

Again ask the participants to brainstorm ideas about what the job description or duties of a volunteer guinea worm worker should be. Hopefully the following items will be mentioned:

- Visit households monthly to find out who has guinea worm
- Forward reports of cases to district health staff
- Educate villagers as a group about preventive methods
- Mobilize co-villagers for self-help projects (such as digging a well)
- Provide first aid to guinea worm victims
- Educate individual patients to avoid spreading guinea worm
- Mobilize friends and family members to help collect water for infected individuals
- Talk to schoolchildren about preventing guinea worm
- Distribute filters and monitor their use
- Participate in chemical treatment of water as appropriate
- Monitor the maintenance of village water supplies

Indicate that the above items form the basis for training village volunteers. In addition, training should focus on the case definition of guinea worm. As seen in the Apata case study, villagers may have different ideas about guinea worm than do health workers. Training should be interactive, allowing volunteer villagers to express their ideas about the disease, then comparing their perceptions with the chosen definition in an effort to find a common ground.

Additionally, note that the list of jobs/tasks for the volunteers contains more than just surveillance and reporting. As noted, guinea worm control should be integrated into primary health care. The village worker will gain more respect and cooperation if he or she can address a variety of concerns (water supply, education, first aid) instead of appearing simply as an interviewer, inquiring only about who has the disease without offering help.

Distribute **Handout 5.7**, a sample monthly report form for village volunteers. Ask participants to comment on training that may be required for local people to use such a form. Finally, explain that a village volunteer program needs much support, encouragement, and supervision to succeed. The volunteer who is not supervised will lose interest. Volunteers may have misconceptions about their roles and unrealistic expectations. The local guinea worm eradication staff needs to visit the volunteers regularly. This may not be easy in large districts with dozens of villages where the disease is endemic. Consider alternatives such as meeting volunteers at popular local markets.

Guest Speakers

If the country has begun using village-based workers for the eradication effort, some of these workers and their supervisors should be invited to talk about their daily duties and the problems they encounter.

Group Task

Distribute **Handout 5.8**, which now shows us some data from the farm hamlets surrounding Apata. Divide the participants into small groups (varying the composition from previous exercises). Ask each group to carry out the following tasks as posted on **Flipchart 5.14**:

- Calculate the guinea worm incidence rate for each hamlet/ward and Apata overall
- Graph the monthly changes in incidence
- Discuss the implications of the results
- Present the results/graphs on flipchart paper
- Complete these tasks in 20 minutes

Briefly review the results as posted and ask the groups to share their observations and interpretations. Note that monthly surveillance gives a better picture of the disease pattern and a better idea of timing intervention so it is in place prior to the main transmission season. Note also that the pattern of transmission may not be the same for all settlements in an area. Early reports should trigger a response from the eradication team.

10. Water Contact Observation Guide — *45 minutes*

Another major part of community surveillance and study is identifying guinea worm transmission sites and the behaviors of the target population in relation to these sites. A village map is therefore crucial for planning.

Refer the participants to the map of Apata Village. Ask them to locate the water holes, ponds, and streams. An observation checklist should then be developed. Display **Flipchart 5.15**, containing the following items that could be included in an observation checklist at a water source:

- location of water source
- distance from houses
- size of source, dimensions
- visible water quality
- activities of people seen at source
- persons infected with guinea worm entering source
- sex and approximate ages of persons seen at source
- nature of contact—which body parts submerged
- duration of contact
- evidence of attempts to protect source from people wading

Discuss all items listed and decide why each is necessary.

Also mention the variations one might observe if one visited the water sources at different times of day and different days of the week. For example, people usually collect water in the early morning or evening, so a visit to the pond in mid-afternoon would not show typical use.

If there is a preexisting national instrument for this purpose, distribute it for critique. Also distribute **Handout 5.9**, a prototype water contact observation form.

Briefly describe the information derived from observational findings using the following items displayed on **Flipchart 5.16**:

- Total number of people coming to water source during period observed, by age (approximate) and sex
- Number and percentage of people, by time of day and day of week
- Number and percentage engaging in certain activities—
    - washing clothes
    - bathing
    - fetching water
    - fishing
    - recreation/playing
- Parts of body that come in contact with water—
    - percentage people who wade in up to their ankles
    - percentage who go in up to knees

- percentage who get arms wet
- percentage who immerse whole body

- Average amount of time people come in contact with water

Indicate that this information will be useful in helping us understand who is helping spread guinea worm and why they are in contact with water. This will help us plan preventive action geared to specific target groups.

11. Surveillance Problems *10 minutes*

Now that the participants have looked at examples of both active and passive surveillance, distribute **Handout 5.10**, Surveillance Problems in Apata Village. Give them five minutes to read it.

Note that surveillance problems can be of two kinds:

- **overreporting** of false cases, thereby inflating the true picture
- **underreporting** of actual cases, thus minimizing the apparent extent of the problem

Inquire of the participants what they think are the problems associated with either extreme.

Ask them whether such problems may arise in their own villages.

Can they add other problems to the list?

12. Field Work Introduction *10 minutes*

Practical field work using one or more of the surveillance methods described above may be arranged if time and resources permit. Prior to entering the field, participants will need a brief orientation. Even if the group is not making a field visit at this time, the lecture may still be of interest to participants to help prepare for future surveillance activities on return to their base.

Use the points below to describe the process needed to prepare for community surveillance activities. Display the major steps on Flipchart 5.16.

- seek permission and involvement of community leaders
- develop sketch map of the area
- count the number of houses
- learn about local household structure
- identify appropriate times to visit homes

- consider any local taboos, such as men not interviewing women
- recruit and train interviewers
- assign interviewers to sections of community
- select supervisors for each section
- prepare adequate number of survey forms
- arrange appropriate transportation
- announce publicly the time and purpose of the survey
- review completed survey forms daily to check accuracy

Guest Speaker

If someone is available locally who has actually conducted surveillance surveys, it would be ideal to have him or her deliver this lecture and talk to the group about real problems encountered in preparing for a survey.

13. Data Management and Utilization *15 minutes*

Refer participants to the various handouts and flipcharts that contain sample data collection forms and summaries of collected data. Point out that information appearing on forms and survey sheets constitutes "raw" data. This information must be processed and analyzed in order for any sense to be made about the nature and extent of guinea worm.

Explain that one major reason poor-quality data are gathered during surveillance is that health workers, villagers, and others recruited to collect information do not understand why the data are being collected and are rarely involved in analyzing them or receiving feedback from supervisors on the importance of the findings.

Ask participants to compare the data found on the summary sheets and records (e.g., Handouts 5.3 and 5.8 and Flipchart 5.11) with the graphs and incidence/prevalence calculations they have made. They should observe that the processed or analyzed data are more meaningful than raw data.

Explain that one of their duties in the guinea worm eradication effort is to help local staff summarize, analyze, and graph their data. Together, they should then sit down and discuss the implications of the data. For example

- Which settlements should be targeted first?
- Is the disease pattern changing in villages where intervention (e.g., filters) has occurred?

- Has human behavior (e.g., contact by infected people with local water sources) changed as a result of health education?
- What is the best month to start intervention in each village so that control measures are in place before new cases appear?
- Which village-based workers are submitting reports regularly and which are not?

Comment again on the importance of feedback. Give examples of newsletters and supervisory visits in which national/zonal staff share findings with the local eradication staff and exchange ideas on how to make the program more effective.

14. Wrap-up *15 minutes*

Review the session objectives with the group and answer questions or make clarifications. Ask participants to discuss how they might apply what was presented in this session when they return to their communities.

If appropriate, announce times when practical field activities (practice surveys, pond observations, village worker supervisory visits, etc.) are planned and remind participants to be on time and to bring necessary materials with them.

Trainer Notes

- Remember to plan a lunch break in the middle of this session.
- If possible arrange for a local speaker to talk about practical experiences in planning surveys and using village-based workers.
- During the evening, participants may be taken out for field work. It is strongly suggested that field work focus on the main current surveillance method(s) used in the national eradication program.
- Trainers should use their discretion in adapting this module. Different countries are at different stages in the eradication (and surveillance) process. Some are about to begin their initial case searches, others have completed several searches and are moving on to village-based monthly data collection. As programs progress there may be greater emphasis on strengthening notification of disease through accurate clinic reports and observational studies to monitor and evaluate intervention. Trainers therefore may choose to select some sections of this module for detailed study and deemphasize others, e.g., focus more on village-based monthly surveillance rather than clinic record analysis.

Materials

Handouts

5.1 Definitions of Surveillance

5.2 Evolution of Surveillance Strategies

5.3 Extracts from Apata Clinic Records

5.4 Clinic Data Summary Forms

5.5 Prototype Case Search Survey Forms

5.6 Graphic Presentation of Case Search Data

5.7 Sample Monthly Village Worker Data Form

5.8 Monthly Surveillance Data from Apata Village

5.9 Water Contact Observation Checklist

5.10 Surveillance Problems in Apata Village

Prepared Flipcharts

5.1 Session Objectives

5.2 Surveillance Definition—Group Task

5.3 CDC Case Definition of Guinea Worm

5.4 Surveillance Information Needed

5.5 How Information Is Collected

5.6 Definitions of Active and Passive Surveillance

5.7 Analysis of Apata Clinic Records—Group Task

5.8 Use of Surveys

5.9 Critiquing Survey Instruments

5.10 Definitions of Household

5.11 Apata Survey Results

5.12 Analyzing Apata Survey Results—Group Task

5.13 Essential PHC Services

5.14 Calculating Monthly Incidence—Group Task

5.15 Items on Observation Checklist

5.16 Steps in Preparing for Field Work

Supplies

- Calculators
- Graph paper
- Rulers/compasses
- Colored pens/pencils

Preparation for Field Work

The option of practical surveillance field work following this session is available. Should trainers choose this option, they must prepare for some hard work in readying the field site. The choice of fieldwork is of course predicated on the assumption that the training site is located near a community where guinea worm is endemic.

It may take up to one month or longer to prepare a field site for this work. The following steps must be completed depending on the specific type of surveillance activity (observation, survey, clinic review, or village worker supervision) that is desired:

- permission from local authorities
- assistance from local health workers
- notification of village-based volunteers
- mapping of the area to be surveyed
- selection of a sample of typical households
- preparation of adequate numbers of survey forms
- arrangement for guides/interpreters
- adequate transportation
- advance notice to community members
- local speaker to orient participants to the community

The activity can be arranged for an evening or early morning. Participants can be paired. Each pair must have a local guide/interpreter. Counterparts to volunteers who may be attending the workshop as resource people might also be able to serve as interpreters. Pairs could interview a few heads of household, observe at one particular pond, visit one local clinic, and/or supervise one village-based surveillance worker as appropriate.

On returning from the community, participants should summarize and analyze the results obtained. Time can be made available on the following evening to present the results and for the group to discuss its experiences. Various sample forms in this guide or actual national forms may be used. Graphic presentation of the group's findings is encouraged.

DEFINITIONS OF SURVEILLANCE

The following are three definitions of surveillance according to experts in the field.

A surveillance system recognizes and reports information of public health interest to public health authorities. This process should be timely, but not time limited; the ideal surveillance system is one in which cases are quickly, accurately, and continuously reported. A surveillance system, however, is not simply a filing mechanism, and its end should not be one of simply gathering data. The term surveillance should suggest a dynamic exchange between people, in which information is continuously assembled, considered, and communicated ... [and through 'feedback loops'] ... used to provide updates on control activities.

Frank Richards and Donald Hopkins, 1989,
International Journal of Epidemiology,
18(4): 934-943

Surveillance of infectious diseases is defined as the regular collection, summarization, and analysis of data on newly diagnosed cases of any infectious disease for the purpose of identifying high-risk groups in the population, understanding the mode(s) of transmission of the disease, and reducing or eliminating its transmission. Regular analyses of such data for a variety of diseases can lead to recognition of seasonal and long-term trends; geographic areas of elevated or decreased transmission; high-risk groups categorized by age, sex, race, or religious or socioeconomic background; and occupational diseases.

Judith Mausner and Shira Kramer, 1985,
Epidemiology—An Introductory Text,
Philadelphia: W.B. Saunders Company

[and specifically concerning guinea worm...] The goal of surveillance is to collect, analyze, interpret, and disseminate information that will help eliminate dracunculiasis. The core data describe cases of dracunculiasis by place, time, and person. In every dracunculiasis-endemic country, the highest priority is to determine the geographic extent of the disease and the annual number of cases. Surveillance must be tailored to the epidemiologic characteristics of dracunculiasis and to the eradication effort.

Centers for Disease Control, 1989,
Guidelines for Surveillance in
Dracunculiasis Eradication Programs,
Atlanta: Centers for Disease Control

EVOLUTION OF SURVEILLANCE STRATEGIES

ERADICATION PHASE	SURVEILLANCE ACTIVITIES
PLANNING	■ Rapid determination of the extent of the problem through health facility surveys and review of previous studies ■ National case searches at the household level in all guinea-worm endemic regions of the country to target guinea-worm endemic villages ■ Concurrent national survey and mapping of existing and planned water supply improvement projects
INTERVENTION ["ATTACK"]	■ National policy to make guinea worm a "notifiable" disease such that health services make regular reports of all new cases ■ Continued case detection in guinea-worm endemic villages identified in previous national annual case searches on a regular basis, e.g., monthly ■ Ongoing monitoring of implementation of control strategies—placement and use of wells, filters, Abate, etc.
CONSOLIDATION	■ Continued notification from health services ■ Prompt investigation of all reported cases ■ Active case detection through various means of outreach—schools, markets, village health workers, house-to-house—especially focused on transmission season
MAINTENANCE [ELIMINATION]	■ Continued active case detection ■ Prompt and thorough investigation of all reported cases ■ Final searches or surveys to verify the elimination of guinea worm

EXTRACTS FROM APATA CLINIC RECORDS

NAME	ADDRESS	SEX	AGE	CONDITION
3 November				
Jimoh Muya	North Ward	M	6	ulcer
Janet Adebo	South	F	15	guinea worm
Friday Sanya	North	M	17	fever
Adija Yusuf	North	F	28	back pain
Solomon Tayo	New	M	60	blurred vision
Simon Tunde	South	M	3	diarrhea
4 November				
Bola Knle	Farm	F	-	diarrhea
Janet Adebo	South	F	-	gw dressing
Jimoh	-	-	-	ulcer dressing
Elias Jacob	North	-	27	guinea worm
Tobias Eniola	New	M	2	diarrhea
Esther Fashola	-	-	4	fever
Tunde Simon	South	M	3	diarrhea
5 November				
Jomoh	-	-	-	ulcer dressing
Amos	Farm	M	10	guinea worm
Deborah Akin	North	F	-	fever
Suliat Mohammed	North	-	7	ulcer
Elizabeth	-	F	5	earache
Albert Kumah	South	M	54	headache

NAME	ADDRESS	SEX	AGE	CONDITION
6 November				
Adebo	-	F	-	gw dressing
Elias	-	-	-	gw dressing
Suliat Mohammed	North	-	-	ulcer dressing
Sunday Santos	New	M	15	leg wound
7 November				
Amos Kofi	New	M	-	gw dressing
Suliat	-	-	-	ulcer dressing
Stephen Ola	South	M	12	dysentery
Dorcas Temi	South	F	-	menstrual pain
Isiaka Bola	North	-	46	guinea worm
Suliman Adento	North	M	6	ulcer
Mary Femo	New	F	10	fever
Sunday	-	-	-	wound dressing
Yusuf Amusat	North	-	28	guinea worm
Semiu Bello	North	M	7	stomachache
10 November				
Yusuf A	-	M	30	gw dressing
Sarah Benle	New	F	27	rash
Ramon Musa	North	M	-	guinea worm
Sunday S	-	-	-	wound dressing
Akin Tola	South	M	2	fever, vomiting
Elli Tola	South	F	5	diarrhea, fever
Ishola Eyun	Farm	M	3	cough, catarrh

NAME	ADDRESS	SEX	AGE	CONDITION
11 November				
Jimoh	-	-	-	ulcer dressing
J Adebo	-	-	-	guinea worm
Eustace Mella	New	M	5	fever
Sara Benlo	New	F	30	fever, ulcer
Yusuf	-	-	-	dressing
Luke Kato	South	-	4	diarrhea
Amusa Sule	North	M	Adult	body pain
Jane Temo	New	F	5	cough
12 November				
S Benla	New	F	-	guinea worm
Ramon	-	-	-	gw dressing
Samson Shola	South	M	Adult	shoulder pain
Sulemon Ade	North	M	6	guinea worm
Ganiyu Ore	North	M	4	fever
Serifat	North	F	3	diarrhea
Fatimo Bello	North	-	-	vomiting
13 November				
Sule	-	-	-	gw dressing
Fatimo	-	-	-	diarrhea
Patrick Denlo	New	-	Adult	constipation
Mathew Stephen	South	M	8	ulcer
Lucy Samuels	South	-	Adult	headache
Fausa Semo	North	F	4	cough

NAME	ADDRESS	SEX	AGE	CONDITION
14 November				
Aliu Amusat	North	F	3	fever
Cecilia Kunle	South	F	4	cough
Thomas Debo	New	M	2	catarrh
Sule	-	-	-	gw dressing
Abede Remo	South	M	15	guinea worm
Florence Pelto	South	F	18	ulcer
17 November				
Abede R	-	-	-	gw dressing
Akin Leye	Farm	M	Adult	back pain
Mary Toki	South	F	26	guinea worm
Fatima Sule	North	F	Adult	guinea worm
18 November				
Mary T	-	-	-	dressing
Simon Awe	South	M	4	malaria
Samuel Awe	South	M	2	diarrhea
Shola Ebun	New	M	3	earache
Bose Aremo	South	F	6	cough
19 November				
Dada Kende	-	M	16	cuts
Serifa Ibrahim	North	F	18	guinea worm
Mary	-	-	-	ulcer dressing
Toka Yau	New	M	5	fever
Bidemi Surat	North	F	33	guinea worm
Abinto Juraz	North	F	44	guinea worm

NAME	ADDRESS	SEX	AGE	CONDITION
<u>20 November</u>				
Abinto	-	-	-	dressing
Alice Tedo	New	F	7	conjunctivitis
Eman Chide	South	M	23	ankle sprain
Rinto Beko	North	F	5	fever
<u>21 November</u>				
B Suraj	-	F	-	dressing
Michael Yau	New	M	3	gum pain
Yusuf Aumsat	North	M	Adult	guinea worm
Kofi Tedo	New	M	10	conjunctivitis
Peter Wollo	South	M	11	conjunctivitis
Felicia Embo	South	F	9	conjunctivitis
Seki Suraj	North	F	5	worms
Dele Dapo	South	M	7	leg ulcer
Bunmi Rento	South	F	12	conjunctivitis
<u>22 November</u>				
Yusuf	-	-	-	ulcer dressing
Dele	-	-	-	ulcer dressing
Rebecca Rento	South	F	9	conjunctivitis
<u>24 November</u>				
Abdul Brahim	North	M	2	diarrhea
Akeem Ake	North	M	15	guinea worm
Fausat Molla	North	F	3	cough
Kareem Raheem	-	M	2	fever
Rasheed Musa	-	M	4	diarrhea

NAME	ADDRESS	SEX	AGE	CONDITION
<u>25 November</u>				
Dele	-	M	-	gw dressing
Abeke Leke	South	F	10	conjunctivitis
Samuel Ola	New	M	Adult	blurred vision
Bemi Loni	South	F	3	vomiting
Lola Sunday	South	F	4	fever
<u>27 November</u>				
Chuku Samuels	New	M	15	headache
William Adenle	South	M	12	conjunctivitis
Dele Edet	South	F	37	guinea worm
A Ake	-	M	-	ulcer dressing
Sylvia Esse	South	F	40	dizziness
Victor Taiwo	Farm	M	Adult	backache
<u>28 November</u>				
Doris Kofi	New	F	5	fever
Ake	-	-	-	dressing
Edet	-	-	-	dressing
Dele	South	-	-	guinea worm
<u>29 November</u>				
Wuni Peters	South	M	-	guinea worm
Menlo Bello	North	M	Adult	constipation
Arula Bello	North	F	Adult	guinea worm
Kande Timi	South	F	3	diarrhea
Chiyeni Williams	New	F	45	leg ulcer

CLINIC DATA SUMMARY FORMS

Form A: Guinea Worm Patient List

Month:______________________________

Clinic:______________________________

Date of First Visit	Sex	Age	Address (Ward)

Form B: Clinic Attendance Summary

	Sex			
Age	Male	Female	Not Known	Total
< 5 years				
School-age				
Adult				
Not Known				
Total				

Notes:

1. For confidentiality, names are not used on Form A.
2. Form B can be used for all patients and can also be made out separately for each ward.

Form C: Guinea Worm Patient Summary

Draw a form like Form B, and fill in the spaces with data on guinea worm patients who are listed in Form A. Note that the forms may be modified to compare sex versus address (ward) or age versus ward.

PROTOTYPE CASE SEARCH SURVEY FORMS

If available, use the case search survey forms currently used in your country. If they are inaccessible, use the attached forms.

FORM 1: VILLAGE HOUSEHOLD SURVEY

Page:__________

Village:____________________

District / Autonomous Community / Clan__________

LGA:____________________

State:____________________

Household Number	Head of Household	No. of Persons in Household	No. of Cases of Guineaworm		Filter Drinking Water		
			July 1988 to June 1989	Now	Always	Sometimes	Never
* Also Complete Form 1-A							
* Also Complete Form 1-A							
* Also Complete Form 1-A							
TOTAL							

Definition: An individual exhibiting or having a recent (one year) history of skin lesion(s) with emergence of a guinea worm(s)

Note: For the purpose of data collection and analysis, Guinea worm season refers to 1 July 1988 and ends 30 June 1989.

Data Provided by:

Name____________________

Title____________________

Signature____________________

Date____________________

Supervised by:

Name____________________

Title____________________

Signature____________________

Date____________________

NIGERIAN GUINEA WORM ERADICATION PROGRAMME
FORM 2 - VILLAGE REPORT

Village Name: ______________________

Record No. ☐☐☐☐☐☐☐☐☐

District / Clan / Autonomous Community: ______

____

LGA: ______________________

State: ______________________

Number of Households in Village ☐☐☐☐

Population ☐☐☐☐☐

Is there a village health worker in your village Yes ☐ No ☐

Number of households Interviewed: ☐☐☐☐

(All households in village should be interviewed)

Number of persons in households interviewed ☐☐☐☐☐

Guinea Worm cases 89 / 90 ☐☐☐☐☐

Active Guinea Worm Cases (now) ☐☐☐☐☐

Filter water: Number Always ☐☐☐☐

Number Sometimes ☐☐☐☐

Number Never ☐☐☐☐

Major Source of Drinking water in Guinea worm season

No. Pool / Pond / Stream ☐☐☐☐

No. Wells / Boreholes ☐☐☐☐

TOTAL Number of Drinking Water Sources in Village

	Total Available	Used During Rainy Season	Used During Dry Season
Ponds / Pools	☐☐☐☐	☐☐☐☐	☐☐☐☐
River / Stream	☐☐☐☐	☐☐☐☐	☐☐☐☐
Borehole	☐☐☐☐	☐☐☐☐	☐☐☐☐
Hand dug well	☐☐☐☐	☐☐☐☐	☐☐☐☐
Others (specify)	☐☐☐☐	☐☐☐☐	☐☐☐☐

Non - functional Boreholes / wells requiring repair

	Number	State problem if known	Suppliers
Boreholes	☐☐☐☐	______	______
Wells	☐☐☐☐	______	______

INTERVENTIONS

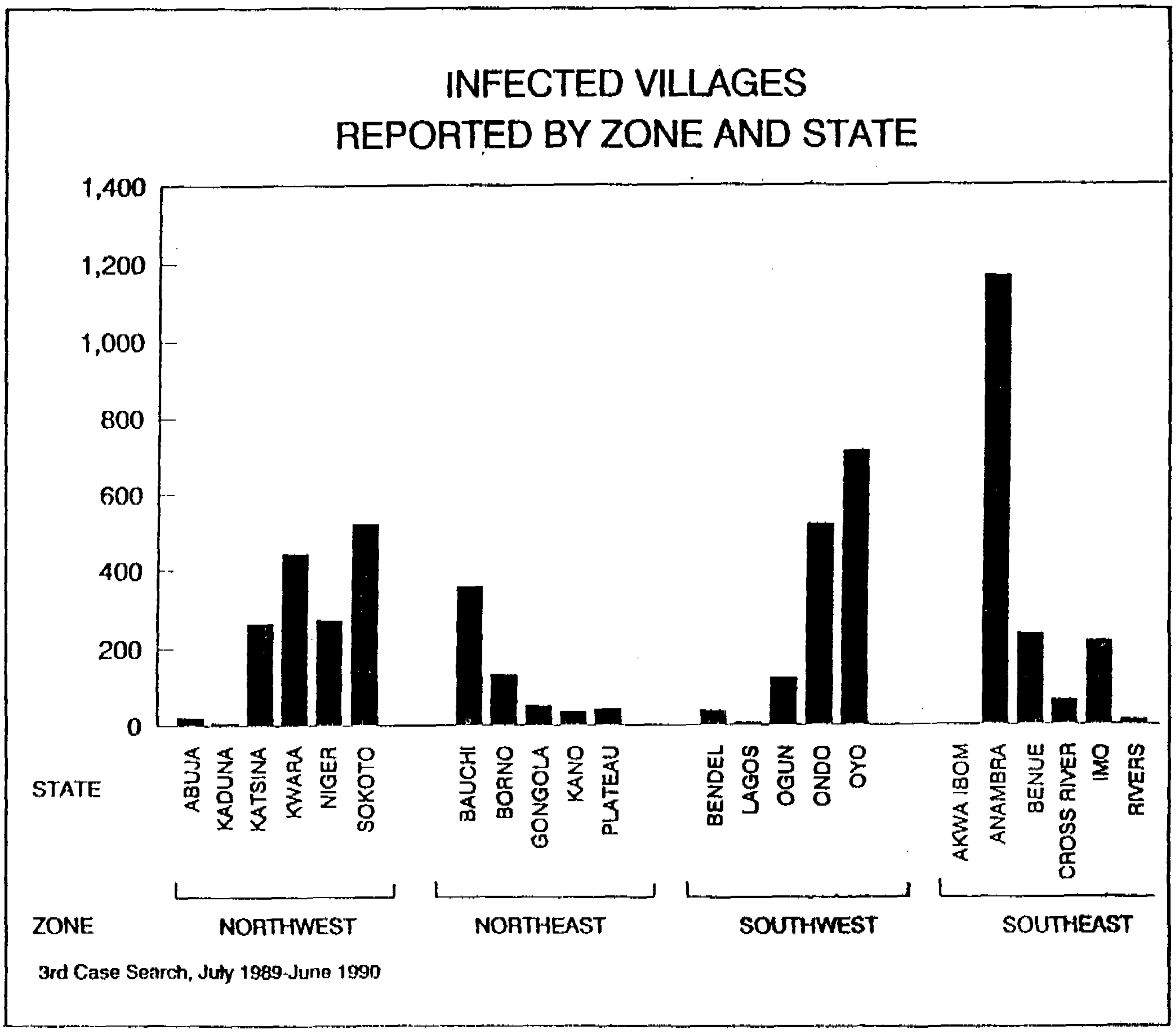
Intervention	Specify (Tick all that apply)		By whom	Date Started
Health Education	Health Talk	☐	______	______
	Filter Demonstration	☐	______	______
	Radio / TV	☐	______	______
	Posters / Leaflets	☐	______	______
	Other	☐	______	______
Filters	Cloth	☐	______	______
	Nylon	☐	______	______
	Clay / Sand	☐	______	______
Abate Treatment		☐	______	______
New Water supply	Borehole	☐	______	______
	Well	☐	______	______
	Rainwater Harvest	☐	______	______
	Pipe-borne	☐	______	______
	Any other	☐	______	______

GRAPHIC PRESENTATION OF CASE SEARCH DATA

Use bar charts, histograms, pie charts, and maps from your own national or regional case searches. If these are unavailable, use the sample materials attached.

Fig 3 Infected Villages Reported by Zone and State

This graph shows the number of Guinea worm infected villages in each state grouped by PHC zone. Both zones in the northern part of the country have disproportionately high numbers of infected villages when compared to the cases and villages reported in the southern zones. This reflects the more dense population patterns in the South and sparsely populated villages in the North.



SOUTH WEST ZONE

Fig 17 Guinea Worm Cases in Nigeria, South West Zone

This chart shows the number of cases in the South West Zone. Ondo State has the largest number of cases in this zone with 78,032 (85.5%) cases. It is followed by Oyo State with 11,584 (12.6%) cases. Ogun and Bendel States have less than 1% with 887 and 773 cases respectively while Lagos State reported only two cases in the last search.

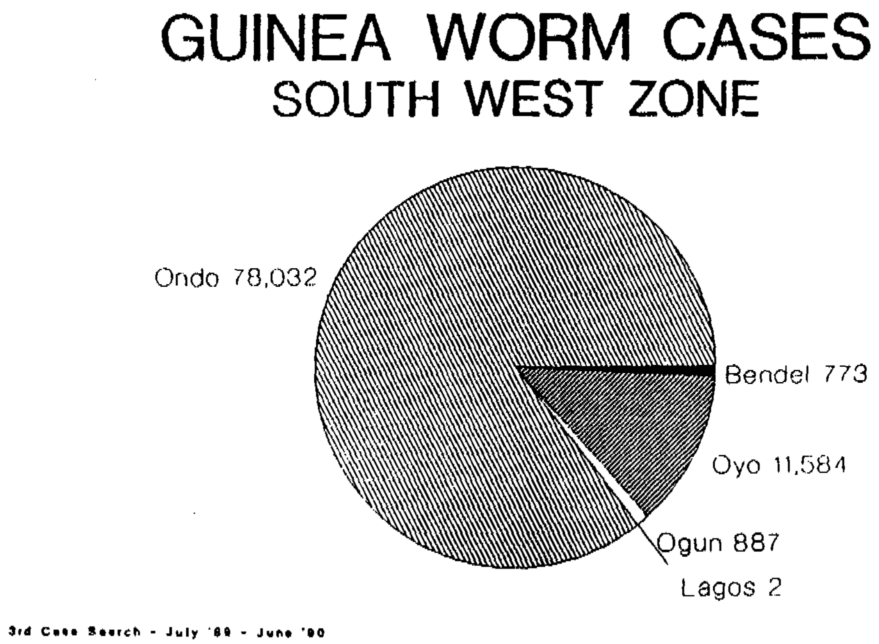
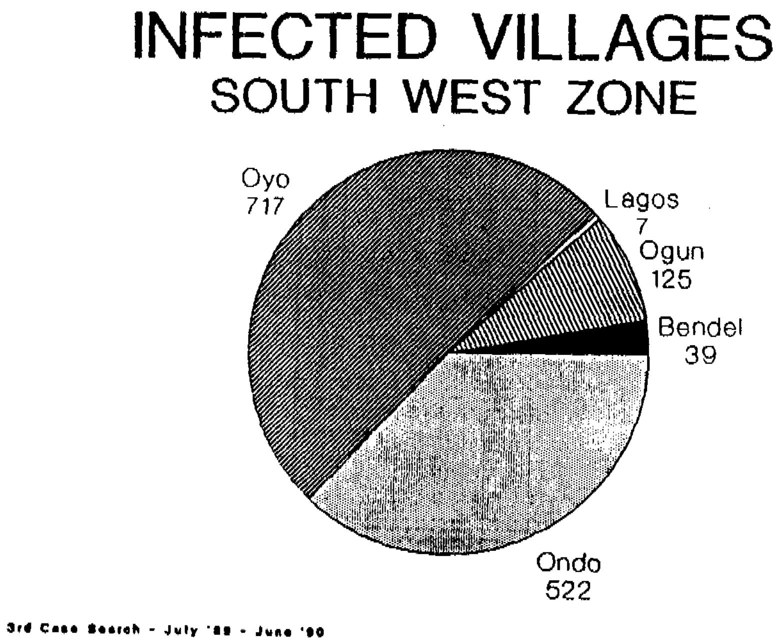


Fig 18 Infected Villages in Nigeria, South West Zone

The infected villages in the South West Zone show a different pattern of distribution than the cases. Although Ondo State has the greatest number of cases in this zone, Oyo State has the greatest number of infected villages. Oyo State reported 717 (50.9%) infected villages this year while in Ondo State there are 522 (37.0%) villages. The remaining three states have 171 (12.1%) infected villages among them.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control

Memorandum

Date April 8, 1991

From WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis

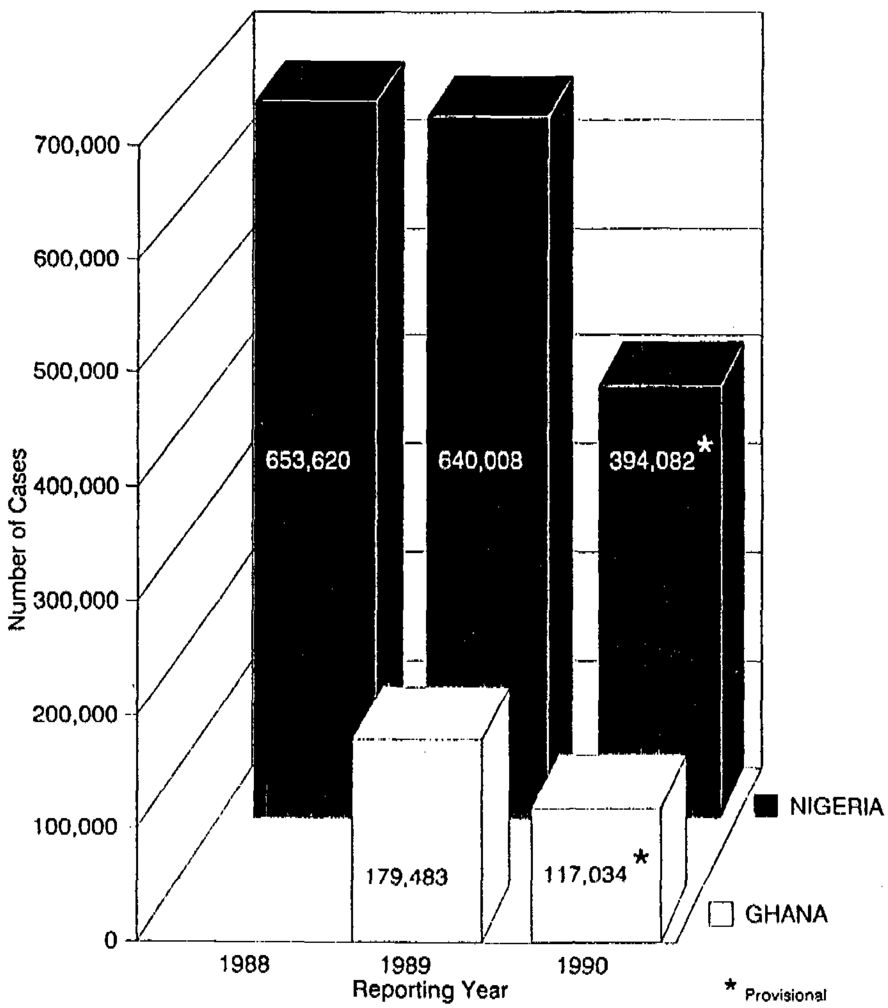
Subject GUINEA WORM WRAP-UP #31

To Addressees

GHANA, NIGERIA REDUCE DRACUNCULIASIS BY ONE-THIRD

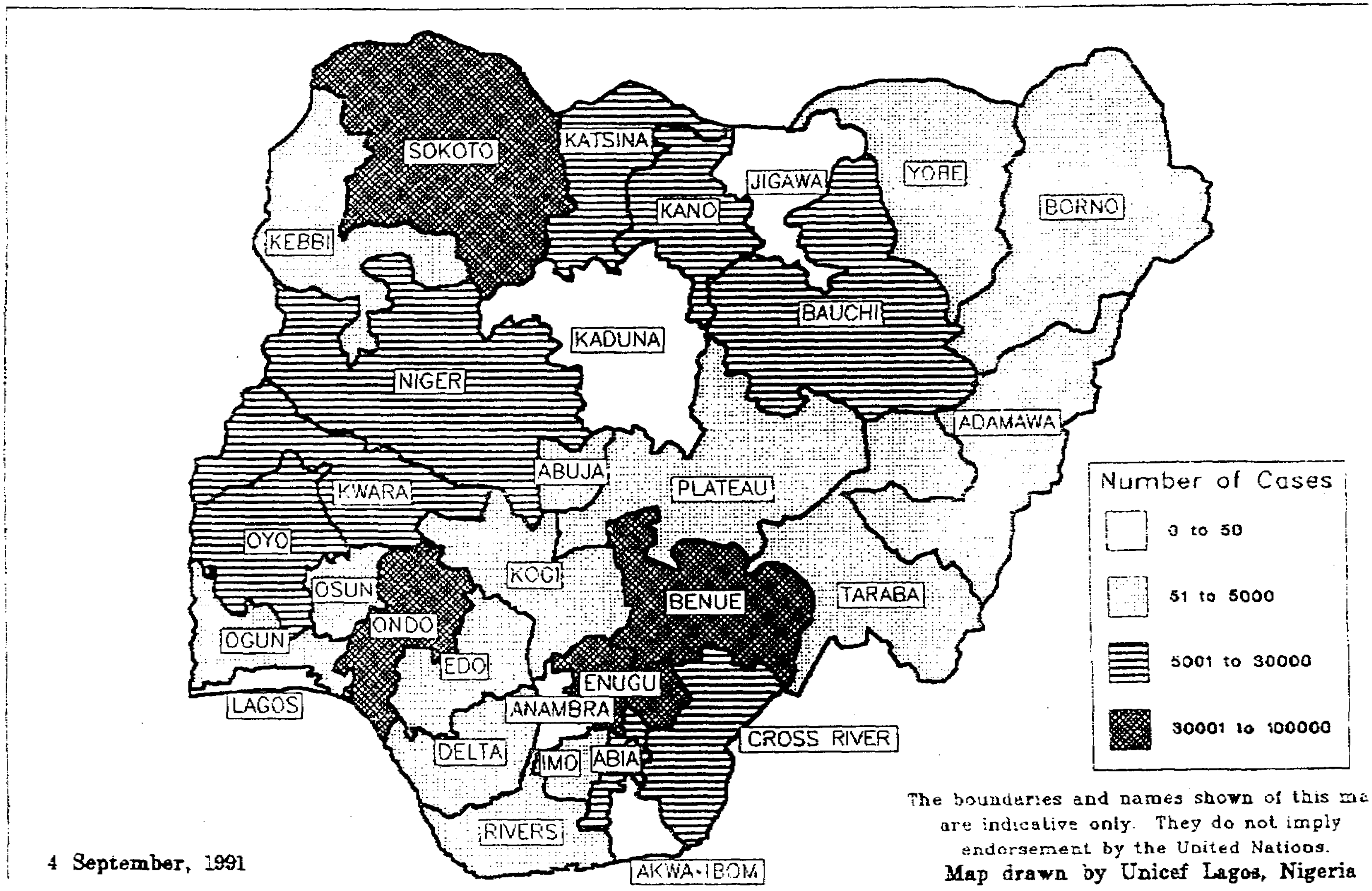
Provisional results of active surveillance in Ghana and Nigeria in 1990 show that both countries reduced the incidence of dracunculiasis dramatically since 1989. In Ghana, the reduction of cases was 34.8%, from 179,483 cases in 6515 villages in 1989 to a provisional total of 117,034 cases in 4768 villages in 1990. During the same period, Nigeria reduced its cases by 38.4%, from 640,008 cases in 6097 villages in 1989 to a provisional total of only 394,082 cases in 5238 villages in 1990. The 1990 Nigeria data do not include Kano State, which found less than 6000 cases in 1989. These substantial reductions are added proof that these two most highly endemic countries are well on the way to achieving their goals of eradicating dracunculiasis by 1993 (Ghana) and 1995 (Nigeria).

NUMBER OF CASES OF DRACUNCULIASIS DETECTED DURING NATIONAL SURVEYS IN NIGERIA (1988-1990) AND GHANA (1989-1990)



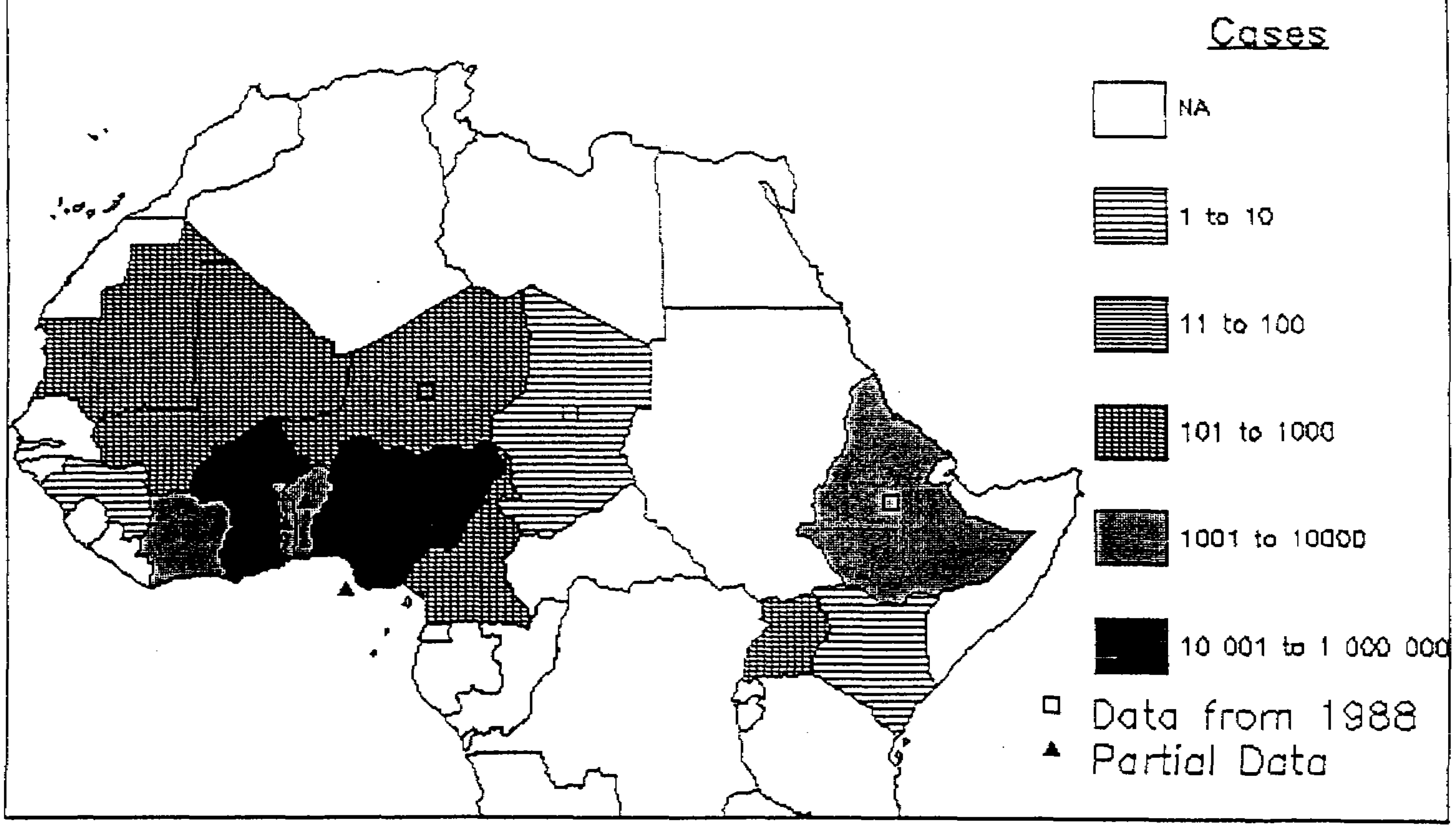
Guinea Worm Cases in Nigeria by State

July 1989 - June 1990



Dracunculiasis Cases

Data from 3rd African Regional Conference, March 1990



SAMPLE MONTHLY VILLAGE WORKER DATA FORM

Use monthly surveillance forms currently employed in your country. If these are unavailable, distribute the attached prototype form, which is used by Nigerian village-based surveillance volunteers.

HOW TO FILL OUT THE VILLAGE MONTHLY SURVEILLANCE FORM

The Village Monthly Surveillance Forms are to be filled out each month. Keep this book for your records. The necessary steps needed to complete these forms are:

1. Take the necessary time each month to visit all households in your village to search for new guinea worm infections. You should search at the same time each month.

2. Provide the day, month and year in which the information was collected in the spaces on the top of the form.

3. At each household ask each person who has a guinea worm when the worm first emerged from under the skin. Then record in Column A the names of only those persons with guinea worms that emerged this month.

4. Provide the information for each new case of guinea worm each month. Use a new page in the book each month.

   Column A: provide the names of all persons found to have a newly emerging guinea worm this month in your village.

   Column B: is to record the ages of the persons

   Column C: is to record whether the person is male or female (record as M or F).

   Column D: is to record the type of drinking water sources used by the household of each guinea worm infected person. Use the numbers (1-6) on the bottom of the form. More than one type may be used by a household. If water type is not one of the first 6, write number 7 (Other) and describe the water sources briefly.

   Column E: Record the type of intervention provided to the infected person that month. Use the numbers (1 - 4) to record interventions for each infected person.

   Options: Bandaged wound (1)
   Filter given (2)
   Health Education (3)
   Tetanus Toxoid (4)

   Tick (✓) off in the box next to any intervention action you have taken this month in the village.

   Show the book with completed forms each month to the LGA Guinea Worm Co-ordinator upon his/her visit to your village or your visit to LGA headquarters.

VILLAGE MONTHLY SURVEILLANCE FORM

VILLAGE ______________ DAY ______ MONTH __________ 199 ____

NAME (A)	AGE (B)	SEX (C)	TYPE OF DRINKING WATER SOURCE USED BY HOUSEHOLD (SEE LIST) (D)	INTERVENTIONS (See list on facing page) (E)

Drinking Water Sources

1. Pond or Pool
2. River, Spring, Stream, or Canal
3. Boreholes
4. Hand Dug Well
5. Rain Water Catchment
6. Piped Water
7. Other (specify)

Tick Interventions used this Month

- [ ] Health Education of Infected persons Listed
- [ ] Health Education Talks
- [ ] Infected Persons Treated
- [ ] Filters Given to Households
- [ ] Filters Given to Replace Damaged Ones

Give a Number for any change in water safety

____ Pumps Broken
____ Pumps Fixed
____ New Wells
____ New Boreholes
____ Ponds Treated

MONTHLY SURVEILLANCE DATA FROM APATA VILLAGE

Population of Apata Village and Hamlets

Main Town:

North Ward	1,000
South Ward	1,000
New Ward	500
Total	**2,500**

Hamlets:

Onileekaa	70
Ajelaunwa	60
Odo-Eye	40
Abiluyungba	30
Tobalogbo	100
Ashipa-Afefu	70
Olowolayemo	50
Iyalashe	60
Igbo-Iroko	30
Araromi	50
Total	**560**

MONTHLY REPORTING OF GUINEA WORM CASES IN APATA

by Village Health Workers

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
North Ward	2	23	37	58	23	15	4	4	2	0
South Ward	3	17	45	28	13	8	2	0	1	0
New Ward	0	0	2	3	17	2	0	0	0	0

Onileekaa	0	0	0	0	0	0	0	0	0	0
Ajelaunwa	0	0	0	1	0	0	0	0	0	0
Odo-Eye	1	2	2	3	1	0	0	0	0	0
Abiluyungba	0	0	1	1	0	0	1	0	0	0
Tobalogbo	5	6	7	4	3	1	1	2	1	0
Ashipa-Afefu	15	13	10	8	6	3	1	1	2	0
Olowolayemo	6	7	8	4	16	6	3	3	2	1
Iyalashe	0	0	5	1	0	0	0	0	0	0
Igbo-Iroko	0	0	0	0	0	0	0	0	0	0
Araromi	10	7	13	6	4	3	7	8	4	2

WATER CONTACT OBSERVATION CHECKLIST

Part A: Observation Data Form

Mark parts of body of figures below contact water.

Person	[1]	[2]	[3]	[4]	[5]
	o	o	o	o	o
	ooo	ooo	ooo	ooo	ooo
	o o o	o o o	o o o	o o o	o o o
Contact	o o o	o o o	o o o	o o o	o o o
	o	o	o	o	o
	o o	o o	o o	o o	o o
	o o	o o	o o	o o	o o

Time in					
Time out					
Total (duration)					
Activity					
Sex					
Age					
Guinea worm					

Note: Make sure you have the number of Part A forms needed to observe and record every visitor to the water source in the specified period of time.

Part B: Characteristics of Water Source

Location of Water Source: ________________________________

Dimensions of Source: ________________________________

Number of Points to Enter: ________________________________

Evidence of Source Protection: ________________________________

Plant and Animal Life: ________________________________

Observed Water Quality: ________________________________

Note: Make enough Part B forms to cover each source observed.

SURVEILLANCE PROBLEMS IN APATA VILLAGE

	Overreporting	Underreporting
Passive Search	■ At the local government dispensary, guinea worm ulcers are dressed like other wounds, so if the patient comes for daily dressing for five days, the dispenser records it in the ledger book each time as a case ■ School attendance records show a drop during the guinea worm (dry) season, but the reasons are not recorded, so cannot attribute all to guinea worm as children may be absent to help with harvesting	■ The dispensary has few supplies, so may people do not utilize it ■ People do not believe that Western medicine is effective for guinea worm, so over 90% of cases are self-treated ■ Many victims cannot walk when they have guinea worm ■ Mostly children come for treatment/dressing as older people believe that covering the ulcer will anger the worm
Active Search	■ Local beliefs blame guinea worm for many internal aches and pains and any swelling on the skin, even when no worm is visible, so if case description in survey questions is not specific, up to 5% of positive responses will be false ■ Many people in an endemic area would have had guinea worm sometime in their life, so unless questions make an unambiguous time reference using a local event, telescoping of reported cases will occur	■ Some villages are inaccessible by motor transport during some parts of the year, and these are just the type of villages where guinea worm lurks ■ There is much mobility within the district, state, and region, so a resident who contracted the disease in his village may not be around when the counting is done. ■ Proxy reporting for others is often inaccurate as people hesitate to give out information about their neighbors.

Session **6**

HEALTH EDUCATION WITH INDIVIDUALS AND GROUPS

4 hours, 15 minutes

Objectives

By the end of this session, participants will have

- defined health education,
- identified specific health behaviors needed to promote various guinea worm control technologies,
- listed antecedent factors that influence these behaviors,
- chosen an appropriate combination of hygiene education methods to address these antecedent factors, and
- described the characteristics of stories, demonstrations, and visual aids as specific health education methods.

Overview

During the introduction, the trainer should explain the session's objectives and how health education will be one of the volunteers' major contributions to the eradication effort. First individually, then in small groups, and finally in the large group, a definition of health education will be developed and discussed. Ensuing discussion will focus on the concepts of behavior and voluntary change and why voluntary change is especially important.

Participants will examine the idea of health education diagnosis, starting with identifying target behaviors. A brainstorming activity will help them identify factors that influence people's behavior. These factors are grouped under predisposing, enabling, and reinforcing headings, which makes it easier for health educators to select appropriate strategies. This theoretical construct will then be applied during a small group exercise.

The participants will work with selected guinea worm control measures and develop diagnosis charts, which will be displayed later during a "poster session." Following lunch, the participants are to examine and try out three common health education techniques: storytelling, demonstration, and visual aids.

Procedures

1. Introduction ***45 minutes***

Explain to participants that health education will be one of their major contributions to the guinea worm eradication effort. Also note that health education as applied to water and sanitation projects is often called "hygiene education," just as health education applied to food and nutrition programs is called "nutrition education."

Individual Task

Ask each member to write a short definition of health education in five minutes or less.

Small Group Task

When each person has finished writing, form three or four small groups. Give the groups the following instructions:

- Develop a composite definition on which all group members agree.
- Take no more than 15 minutes.
- Write your definition on flipchart paper and display it where all can see.

Group Discussion

Ask the group as a whole to identify common elements in all the definitions. These items may include the following:

- Health education is concerned with behavior, action, and practices.
- Behavior may be influenced through knowledge, beliefs, skills, and resources.
- Methods may include counseling, instruction, training, demonstration, and organization.
- Target groups may include individuals, families, groups, communities, youths, the elderly, and so on.
- The focus can be on promotion, prevention, treatment, or rehabilitation.
- The ultimate goal is to improve well-being—social, physical, and mental.

Post the following definition on **Flipchart 6.1**:

> Health education is any combination of learning activities that encourage voluntary adaptations of human behavior that promote health, prevent disease, and enhance recovery from illness.

Encourage comparisons and discussion. Point out the key words "behavior" and "voluntary." Health education is that part of public health practice that is concerned with how human behavior relates to health. The basic ethic underlying public health education is "change by choice," not force.

Explain that the concept of voluntary change is especially important when we are working in another culture. It encourages us to learn about the communities and people we are serving so that we will not promote something that may be disruptive or harmful to their normal way of life.

Now display the session objectives on **Flipchart 6.2** and review how the session will proceed.

2. Targeting Health Behaviors *15 minutes*

Explain that health education planning requires "diagnosis." Just as a physician cannot treat a patient without understanding what is wrong, the health educator should not start applying educational methods until he or she understands what behaviors led to or could prevent a problem, and why those behaviors do or do not occur. The first step in this "health education diagnosis" is identifying target behaviors.

Ask participants to recall from Session 2 the main human behaviors responsible for the transmission of guinea worm:

- wading in water by persons with active guinea worm ulcers
- drinking water containing infected cyclops

Now refer everyone to **Handouts 2.2** and **2.4**, which concern transmission and prevention of guinea worm. Note that for each control measure there are behaviors necessary for adoption of that method by the community. Display a list of such behaviors for using a cloth water filter on **Flipchart 6.3**.

- **buy/obtain** a filter
- **use** the filter each time drinking water is collected
- **place** the filter on the pot correctly so that unfiltered water cannot splash into the pot
- **remove** the filter carefully so that cyclops will not spill into the filtered water
- **wash** the filter after use

- **store** it in a safe place to avoid damage
- **inspect** the filter before each use to be sure it has no holes or tears
- **discard** a damaged filter and buy/obtain a new one

Note that the first word of each behavior statement is a verb. This is intentional because our descriptions of human behavior must reflect action. Such statements are necessary so that we can clearly identify what we expect to see if health education has been effective. This seeing or observing is the basis for evaluating our educational efforts.

3. Factors That Influence Health Behavior *75 minutes*

Group Brainstorming

Develop through participant brainstorming a general list on flipchart paper of the different factors that the participants think can influence people's behavior. This will include items such as

- knowledge
- access to services
- availability of money
- encouragement or discouragement by friends
- skills

Now distribute **Handout 6.1**, which shows the health education diagnostic process diagrammatically. Look through the section labeled "educational diagnosis" (behavioral antecedents). Compare the items there with those listed on the flipchart paper.

Brief Lecture

Note that the items on the handout are grouped under three headings:

1. Predisposing factors
2. Enabling factors
3. Reinforcing factors

Explain that the purpose of this grouping is to make it easier for health educators to select the most appropriate strategies and specific methods to tackle a problem.

Describe the first group of factors as ones that concern people's perceptions. Note that these factors are best addressed through communication strategies.

The second group concerns the resources that enable desired behavior to take place; here educational strategies address the need to develop individual and community resources.

The third group encompasses the influences other important people have on individual behavior. A person may wish to change but is discouraged by friends and relatives, so therefore education must find ways to help such people become more supportive, or health educators must organize new support groups for their clients.

Review with the group the second page of Handout 6.1 to see how this diagnosis has been applied to the target behavior of filtering drinking water.

Small Group Task

When all are clear on the diagnostic process, ask participants to divide into three small groups. A facilitator should work with each group to ensure understanding of the diagnostic process. Assign each group a guinea worm control measure:

- preventing infected people from entering ponds
- using well water
- boiling drinking water

Display the following small group tasks on **Flipchart 6.4**:

- List the behaviors involved in adopting the measure.
- Identify predisposing, enabling, and reinforcing factors that influence adoption of the measure.
- Choose one appropriate health education strategy to promote adoption of the measure.
- Write answers on flipchart paper for display.
- Complete this task in 60 minutes.

Poster Session

Display all completed diagnosis charts so that during breaks participants can review each other's work.

Conclude by explaining to participants that the remainder of this session will be taken up with work on three health education methods that can be applied easily in the field. One method is drawn from each of the three broad health education strategy areas shown on Handout 6.1.

Note: A short break is suggested now.

4. Storytelling *30 minutes*

Brief Lecture

Explain to participants that storytelling is an effective communication strategy aimed at the predisposing factors that influence human behavior. Stories not only provide specific items of knowledge, but also encourage listeners to think, understand, and reconsider their attitudes and values. Stories can juxtapose traditional and scientific beliefs for listeners to examine and critique.

Storytelling, including the use of proverbs and fables, is also a very common communication method in traditional societies. Therefore, the method should be familiar in the communities where we are working to eliminate guinea worm. Storytelling is an easy educational method to apply in the field because fancy visual aids and equipment are not needed. Encourage participants to find out more about the style of traditional storytelling and the common characters in traditional fables when they return to the village.

Modeling Storytelling

Use the following procedure to model how a story might be told to a group of villagers:

- Divide the participants into two groups. Tell one half that they will now assume the roles of community members and listen to a story that might be used in a guinea worm education program.
- Tell the other half to take the role of observers and try to identify the steps involved in telling a story properly.
- Greet the assembled group as is done in the local culture. Introduce yourself as a health worker who would like to talk to the group about a problem the village is facing.
- Explain that you would like to start by telling a story. Describe the objective of the story, as contained in **Handout 6.2**.
- Read the story from Handout 6.2 (or even better, tell it from memory), stopping briefly at the end of each paragraph to make sure people understand what you have said.
- Ask the questions at the end of the story and encourage participants to answer as if they were community members.
- Again, assuming they are community members, ask participants to tell you generally what lessons they learned from the story.
- Ask them specifically how they, as community members, might solve the problems faced by the people in the story.

- Close by summarizing the main points, lessons, and possible solutions.

Group Discussion

Now distribute copies of the story (Handout 6.2). Ask the observer group to identify the steps or stages involved in storytelling. Record the group's responses on flipchart paper. Be sure that the actual steps you followed, as underlined above, are mentioned.

The last page of the handout raises the question of adapting the story to other settings. Review the items with participants and ask them what changes they might make in the story so it would be acceptable in their own communities. Participants should make note of these suggestions on their handouts.

Open discussion on the characteristics of a good story. How can we make sure that a story communicates a clear message? Record answers on a flipchart. After a list has been developed, distribute **Handout 6.3** and compare responses and ideas.

Note: A lunch break would be appropriate at this time.

5. Demonstrating Skills *30 minutes*

Explain to participants that according to our health education diagnosis, one reason people may not filter water is that they do not have the skills to do it properly. By properly, we mean that

- the filter must be placed on the pot in such a way that no unfiltered water can splash into it,
- the filter must be removed carefully so that cyclops are not inadvertently allowed into the pot, and
- the filter must be inspected before use to determine if it is damaged.

Recall the list of steps in Flipchart 6.3 and display them again.

Arrange beforehand for two participants to conduct the model demonstration of filtering. Ask the remaining participants to take the roles of community members and observe the demonstration. It should follow the steps in **Handout 6.4**.

At the end of the model demonstration ask the observers to comment on the steps needed for a good demonstration. Make sure that the following points are raised:

- Materials must be prepared and assembled beforehand.
- Local, commonly available and recognizable materials should be used, e.g., if clay pots are more common than plastic buckets, use clay pots.

- Participants must be involved in order to transfer skills, that is, they will learn by doing.
- Participants can be asked to repeat instructions.
- They can be asked specific questions.
- They can share their concerns about how they might adapt the procedure at home.
- Most important, as many participants as possible should be given an opportunity to practice the skill.

6. Using Visual Aids *45 minutes*

Brief Lecture

Briefly explain that visual aids such as posters and flipcharts are standard materials used in health education practice. At the same time, encourage participants to recognize the limitations of these aids. They may look pretty to the artist and health educator, but may not communicate the desired message to the community unless they are properly designed. Note that visual aids, normally, should have been pretested by the designers prior to distribution, but in reality this does not often happen. Pretesting involves showing the poster to a group that is representative of the target population and getting its reactions to the design, colors, size, wording, and general content of the visual material. Pretesting usually results in modification of the design to make the aid more culturally acceptable.

Post the following points on **Flipchart 6.5** and discuss them with the group:

Characteristics of a Good Poster:

- Contains *one* simple message
- Has *one* simple picture without much distracting background material
- Depicts people, objects, and symbols that will be understood and accepted in the local culture
- Avoids frightening or offensive images
- Uses minimal words, ideally in the local language
- Is large enough to be seen at the back of a meeting room

Explain further that there are two common mistakes health workers make when using posters and other visual aids. First, they sometimes simply paste the poster on the clinic or town hall wall and leave it for months until it is worn and torn. After awhile, clients take the poster for granted and no longer "see" it. Furthermore, posters cannot talk and answer questions. If the picture or message is ambiguous, the observer cannot seek clarification from the wall.

Second, when health workers actually do use a poster in a talk, they frequently hold up the poster and tell the audience what should be seen in the poster. This overlooks the fact that the audience may have a completely different perception of the poster contents, thus rendering the health worker's description confusing or contradictory to what the audience observes. As noted, many posters are never pretested prior to distribution. Therefore it is incumbent upon the health worker to seek the audience's opinions first about what they see in the poster.

Demonstrating Poster Use

The trainer should obtain some sample visual aids/posters from the national, state, and local guinea worm eradication effort. One of the participants can hold the poster where all can see, or it can be hung on a flipchart easel. Demonstrate correct poster use by undertaking the following steps:

- Ask the audience what they see in the picture.
- Point to specific people and objects in the picture and ask what they are or what they are doing.
- Seek ideas about the point or message of the poster.
- Request a member of the audience to read any words on the poster.
- Clarify any misconceptions about the poster and summarize the main message.

Post the above steps as **Flipchart 6.6** and review them with the participants. Note that these steps *involve* the audience in the educational process by seeking their views and opinions.

Poster Critique

Post several other posters currently in use in the guinea worm campaign on the walls where all can see. Refer the participants again to Flipchart 6.5. Ask them to critique the displayed posters one at a time. Make sure that both "good" and "bad" posters are available to stimulate discussion. Summarize this session by asking participants to rate which is the best of the displayed posters.

7. Wrap-up *15 minutes*

Close the session by asking participants to describe important things learned and gaps that remain. Compare these observations with the session objectives on Flipchart 6.2.

Explain that these health education methods are not used in isolation, but are often joined together in broader programs and talks.

Ask participants to think about their home environment and what kinds of local stories, fables, proverbs, anecdotes, and allegories are used to transmit information. Briefly seek comments on how these can be used in health education.

Provide a link to the next session by explaining that the participants will be planning how to incorporate these health education techniques into an overall plan of action for their villages.

Trainer Notes

- Make sure there are at least three trainer/facilitators in attendance to work with the small groups during their health education diagnosis exercise.
- You may need to remind participants to have handouts from previous sessions on hand. Supply them with folders or ring binders for this purpose.
- Trainers should practice beforehand the storytelling and filter demonstration to ensure that this exercise runs smoothly.
- Select the two participants who will perform the model filtering demonstration the evening before this session. Review procedures with them and have them demonstrate to you how they will conduct the session.
- Note that lunch and other breaks occur during this session. You will also want to schedule a half-hour break before starting Session 7.

Materials

Handouts

6.1 Health Education Diagnosis: Basic Procedures

6.2 Model Story

6.3 Characteristics of a Good Story

6.4 Planning a Demonstration: How to Filter Drinking Water

Prepared Flipcharts

6.1 Definition of Health Education

6.2 Session Objectives

6.3 Behaviors for Using Cloth Filters

6.4 Small Group Tasks (Educational Diagnosis)

6.5 Characteristics of a Good Poster

6.6 Steps in Using a Poster

Demonstration Materials for Filtering:

Filters, buckets, storage pots (local kind), cups, water, and soap

For Poster Use

Local posters from guinea worm eradication campaign

Reference Materials

It is suggested that trainers have the reference materials listed below on hand for participants. If possible, individual copies of these publications should be obtained in advance for each participant to take home.

Centers for Disease Control. 1991. Guidelines for Health Education and Community Mobilization in Dracunculiasis Eradication Programs. Atlanta: WHO Collaborating Center for Research, Training and Eradication of Dracunculiasis at the Centers for Disease Control.

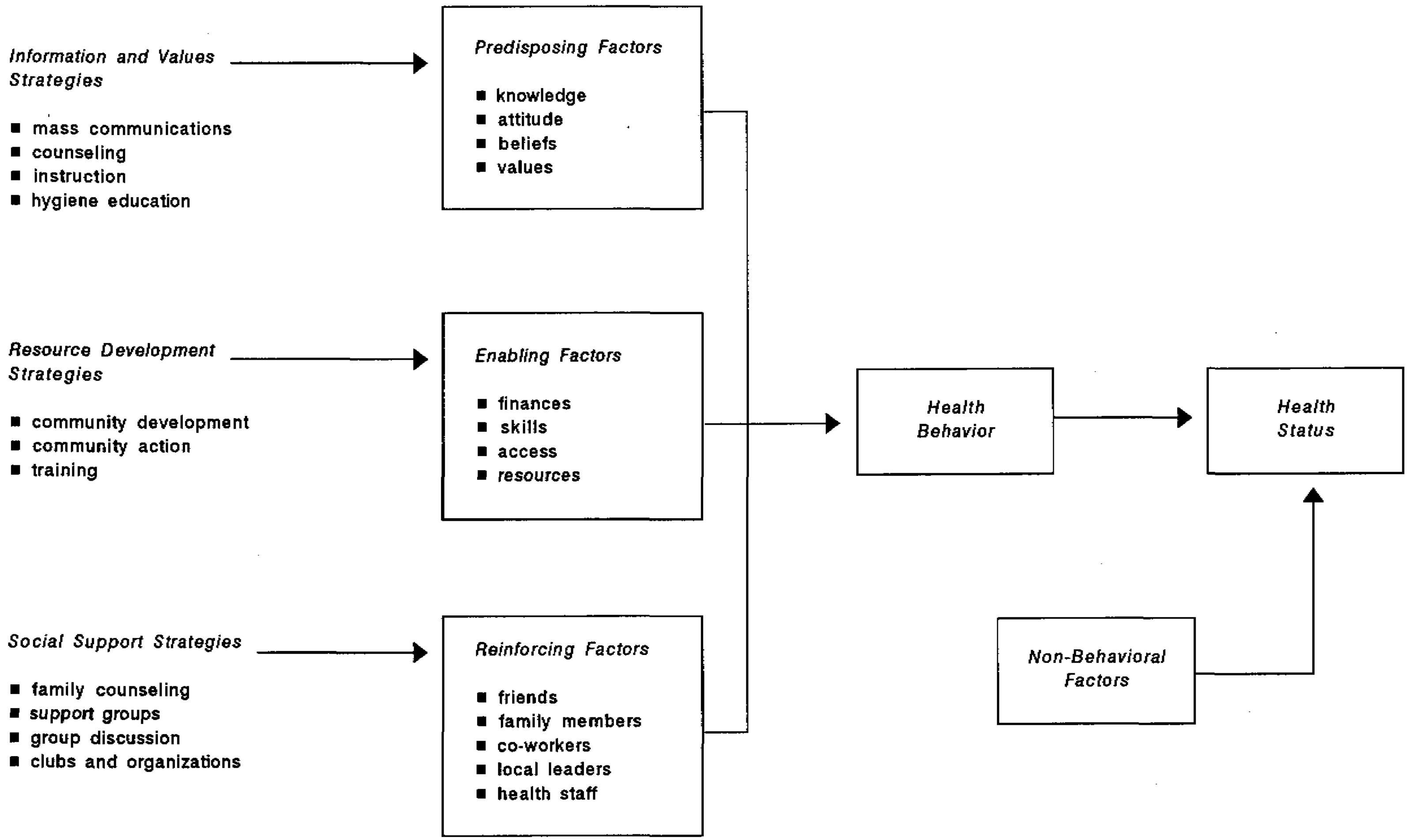
World Health Organization. 1988. Education for Health: A Manual on Health Education in Primary Health Care. Geneva: World Health Organization.

World Health Organization. 1990. Health Education in the Control of Schistosomiasis. Geneva: World Health Organization.

Although the last document listed above concerns another, somewhat related, tropical disease, it does present some useful techniques that can easily be adapted to guinea worm programs.

Health Education Diagnosis: Basic Procedures

Administrative Diagnosis (selecting strategies)	Educational Diagnosis (behavioral antecedents)	Behavioral Diagnosis	Epidemiological Diagnosis



REFERENCE: Green LW, Kreuter M, Deeds SG, Partridge K. Health Education Planning: A Diagnostic Approach. Palo Alto, California: Mayfield Publishers, 1980.

Health Education Diagnosis Applied to Guinea Worm Control: Filtering Drinking Water

Administrative Diagnosis	Educational Diagnosis	Behavioral Diagnosis	Epidemiological Diagnosis

Administrative Diagnosis

Information Strategies

- stories at village meetings
- health talks at clinics
- talks with community groups
- visual aids to depict filtering

Resource Strategies

- organize local tailors and train them to produce filters
- identify locally appropriate cloth
- fundraise to buy cloth
- train VHWs to distribute
- train villagers to use correctly through demonstrations

Social Support Strategies

- discussions at women's clubs
- VHWs to encourage their neighbors to use
- key leaders to encourage use
- human relations training for health staff

Educational Diagnosis

Predisposing Factors

- knowledge of how filter works
- belief that filter prevents
- value that temporary inconvenience of filtering will pay off
- knowledge of correct use

Enabling Factors

- funds to purchase cloth
- supplies of cloth available
- skills to produce filters
- skills to use correctly

Reinforcing Factors

- women, especially elders encourage each other to use
- husbands help acquire filter (buy if being sold)
- supportive village leadership
- health workers use acceptable approach with the people

Behavioral Diagnosis

Behavior

people will filter their water each time they collect it

Epidemiological Diagnosis

Health Status

incidence of guinea worm reduces in following years

Non-Behavioral Factors

- pond water level
- quality of cloth
- presence of cyclops

MODEL STORY

The Story of Babu: One Way to Prevent Guinea Worm

Objectives

After hearing this story, listeners will—

- Identify causes of guinea worm in the community.
- Explain how filtering water can protect them from the disease.

Apata is a village that lies not too far from here. The people of Apata are farmers—good farmers. They grow maize, yams, cassava, beans, and fruit. The money they make from selling these crops has been used in many ways to improve their lives. Most houses have iron-sheet roofs. Many people own radios.

The people of Apata feel that they have an ideal life except for the guinea worm they suffer from each dry season. The disease is so prevalent that the people of Apata believe that they have been cursed. The disease seems to hit hardest just when farmers are busy preparing their fields and planting their crops for the new season.

During the guinea worm season it is not uncommon to see otherwise strong and healthy farmers and their wives laying on mats in front of their houses because guinea worm has knocked them down.

The people of Apata get their drinking water from a few small ponds on the edge of town. These supply plenty of water in the rainy season, but in the dry season when guinea worm strikes, the ponds are shallow. People spend hours scraping the bottom to get enough water to drink. This water is muddy, but Apata residents feel they have no other choice.

Babu is a farmer in Apata. Babu, his sons, and his wives farm about six acres of land about 8 km from the town. Early each morning they trek to the farm. In the dry season the women often stay behind to collect water for the family, and then join the others later. While on the farm, they usually drink water from a nearby stream, but this too is almost gone in the dry season.

It is now February and Babu is trying to prepare his fields for the new yam crop. Unfortunately, only he and one son, Bola, are in the field today. His other sons and wives all are knocked down by guinea worm. Babu fears that he will not have his fields ready by the time the rains come. To make matters worse, Bola has been complaining of a throbbing in his left leg that might mean that a guinea worm is about to emerge. He tells Bola to sit down and rest.

Babu also sits down and looks across his fields in despair. In the distance he sees Musa from the neighboring village of Tabale. Musa is not alone like Babu. All of his children and wives are busy preparing the fields. When they are tired, they go over to a tree and pick up small containers and drink from them. Babu is curious and walks over to greet Musa and find out how he is so lucky to have a full labor force.

Babu and Musa greet and ask after each other's family and friends. They exchange a bit of news about the weather and expectations for the coming growing season and market. Babu has been eying the small containers from which Musa's family has been drinking. Musa then says, "Forgive me for ignoring you. Here, have some water to quench your thirst on this hot day."

Babu thanked Musa and drank his fill. He looked at the container carefully and commented, "This must be a special container. We usually just walk over to that stream and drink water from there. I guess it must be dry now. Is that why you brought your water in containers?"

Musa responded, "You are right about the stream being dry, but that is not the main reason we carry water out to the farm. For the past year we have been using a cloth to filter our water. We fill up these containers from the pot of filtered water. My son who is schooling in the capital says that this should protect us from guinea worm."

When Babu returned home that evening, he told his family members about Musa and the water containers. He laughed a bit, "I am not sure what Musa is really preventing. People in Apata believe guinea worm is part of our bodies. We have been cursed with this disease from time immemorial. Maybe things are different over in Tabale village?"

One wife commented, "The nurse at the health center said something about filtering water, but it did not make sense at the time." Bola added, "When I was in primary school, one teacher used to filter the water the students collected for him. We never understood why he did it, but as small boys we were afraid to ask." Babu began to wonder what he should do about this filtering business.

Discussion Questions

1. Why do members of Babu's family have guinea worm?
2. What problems does guinea worm pose for Babu's family?
3. Is there a way they can protect themselves from this disease?
4. How do we know that filtering may prevent guinea worm?
5. If you were Babu, what would you do now?

Adapting the Story

Read the story of Babu carefully. What changes would you make in order to make the story seem more realistic in the community where you work?

— names of characters

— season when guinea worm is common (e.g., rainy season in sahel versus dry season in savannah)

— types of crops grown (e.g., yams versus millet)

— signs of a good life (e.g., iron-sheet roof)

— family structure and division of labor

— male and female roles

List these and other changes below:

CHARACTERISTICS OF A GOOD STORY

1. Objectives

A story, like any other health education activity, needs a clear objective relating to desired health behavior. What this really means is that the story needs to focus on one main point. For example, the point may be, "When people filter their drinking water, they do not get guinea worm." By the end of the storytelling, listeners should have little trouble identifying the main point or lesson. Similarly, a story should not be cluttered with extraneous or peripheral points.

2. Culture

Two concerns arise when one tries to tell culturally relevant stories. First, there is usually a style of storytelling that is unique to the culture. There may be certain phrases that are always used to start a story. Stories may be told differently if the audience consists of children or adults. Audience response along the way may be encouraged by the storyteller. A fable format using animals as actors may be preferable in some societies. Health educators should learn about these local cultural considerations and develop stories that will fit in and therefore be more easily understood.

The second aspect of culture addresses content. The storyteller should use names, foods, activities, locations, and so on that listeners will recognize. Local beliefs and proverbs should be integrated into the story.

3. Characters

A story should have one or two main characters the audience will be able to identify with and remember. The behavior of these characters will model healthy or harmful behaviors that form the basic points of the story. If there are two characters, one could model preventive behavior while the other engages in risky behavior. If there is only one character, he or she may start out behaving one way and later modify his or her actions. Be careful not to name and model characters too closely with actual people in the village, as this will cause embarrassment.

4. Believable Action

Characters should not engage in strange, foreign, or unbelievable actions. If people usually walk to the farm, do not have characters ride in a car. If people do not eat fruit at their morning meal, do not include fruit in a description of what a character ate that morning. Pattern the action of the characters after the common behavior of villagers. Action is believable when it is simple and straightforward. Do not congest a story with too many twists and turns. Keep it short and focused.

5. Objectivity

Do not use judgmental words in describing a character or his or her behavior. Do not say things like, "That foolish mother refused to give her child an egg." Simply describe the behavior in its local context and let the listener make his or her own conclusions—"Mama Saka always fed Saka maize porridge for breakfast. If she could afford it, she would add a spoon of dried milk, but she would never give the child an egg. Grandmother would not approve, because she believes that eating eggs causes a child to grow up to be a thief."

6. Format

A story may take on two general forms. First a story might objectively present characters behaving in two different ways—e.g., one who drinks water straight from the pond and the other who filters her water. Based on this contrast, listeners can be encouraged to comment on the differences and discuss which is better and why.

The second broad approach is to lead up to a point at which a character must make a decision. The alternatives can be laid out, but the listeners are the ones who will be called upon to suggest the next course of action and justify their choices. This is a problem-solving approach. Choice of format may depend on how much the listeners already know about the subject.

7. Sequence

A story should have a natural flow or logical sequence of events. The beginning sets the stage, introduces the characters, and establishes the problems they face. In the middle, action develops as the characters confront their problems. Relationships and contrasts between characters become manifest. By the end of the story a decision may have been made, a problem solved, a conflict resolved, or at least alternative solutions may have been posed. The end is where the objectives or point of telling the story should be most evident.

8. Involvement

All hygiene education methods should involve the client in thinking about and solving health problems, and a story is no exception. The storyteller should never conclude by telling the audience exactly what they should have learned from the story. He or she should encourage the listeners to think about the story and draw conclusions for themselves.

Questions at the end of a story help listeners focus on what they have heard. The storyteller may ask people to recall what a certain character did, to explain why he behaved this way, to deduce the possible consequences of his action, and to suggest better or alternative behaviors. The problem-solving approach allows for much audience involvement.

PLANNING A DEMONSTRATION: HOW TO FILTER DRINKING WATER

Objectives

1. *Knowledge*

   At the end of this demonstration, participants will

   - state that pond or stream water can contain guinea worm eggs and
   - explain that filtering pond water through a clean cloth can remove guinea worm eggs.

2. *Skills*

   By the end of the demonstration participants will show how to filter drinking water through a clean cloth in order to prevent guinea worm.

Materials Needed

- water from a local pond in a bucket
- local water storage pot or container
- filter cloth as presently used in national eradication program
- samples of other local cloth
- soap and basin with clean water to wash the filter

Note: The filter cloth should be fine mesh cotton or monofilament nylon. Ideally the filter should be sewn with a rubber band or drawstring so that it fits snugly on the pot.

If you want to demonstrate the presence of cyclops as described below, you must use typical water from the local pond.

Procedures

1. *Introduction*

- Greet the participants and introduce yourself, the topic, and the objectives.
- Set up the materials where all can see and ask participants to identify each item.
- Describe what you are about to do (which will be to demonstrate how to filter pond water in order to prevent guinea worm).
- Ask the group if it knows how guinea worm got into the water and how it spreads.

Participants should answer as follows:

- Guinea worm gets into the pond when people with open guinea worm ulcers wade into it.
- The guinea worm releases tiny eggs into the pond.
- Small organisms in the pond swallow these eggs and keep them safely inside.
- When someone drinks this water, the guinea worm eggs are released inside the person's body, where they will grow into a guinea worm some months later.

2. *Demonstration*

Perform each step below and *tell people what you are doing* as you carry out each step.

- Explain that cloth with a fine enough weave can catch the small organisms that contain the guinea worm eggs and in this way prevent one from drinking them.
- Pass around samples of the filter cloth and other local cloth with a wider weave and ask people to note the difference.
- Show that a looser-weave cloth can be doubled over and used for filtering if tighter cloth is not available.
- Inspect the filter to be sure it has no holes or tears.
- Attach the filter to the drinking-water pot (see note below).
- Make sure the filter fits snugly around the edges of the pot with a slight depression in the center.
- Pour the pond water from the bucket very slowly so that none will splash or cause the filter to come off.
- Allow all water to go through the filter.

- Remove the filter carefully so that no dirt or tiny organisms fall into the filtered water.
- Cover the water pot.
- Show the participants any dirt that has collected in the filter (see note below).
- Shake out the filter away from the drinking pot.
- Wash the filter with soap and water.
- Hang the filter to dry in a safe place.
- Remind participants to keep filters away from knives and sharp objects.
- Ask if participants have any questions about what they have just seen.

Note: Before you wash the filter, you may take a clear glass jar, turn the filter upside down over the jar, and pour some clean water through it, thereby releasing cyclops into the jar. With a hand lens or magnifying glass it should be possible to see small organisms, some of which may be cyclops.

Note also: Ideally, filters are made with some marking to indicate a top and bottom side in order to prevent people from reversing the filter and dumping cyclops in their pots. Therefore, **add** to the steps above the need always to place the marked top side of the filter facing upward. Alternatively, if the filter has been washed and dries for more than 12 hours in an airy place, it is unlikely that any cyclops would have survived.

3. *Repeat Demonstration*

Knowledge—Ask participants to repeat in order the steps you have just performed in filtering the water. Also ask them the reasons why you are filtering the water.

Skills—Ask for a volunteer to come forward and repeat the filtering demonstration. Ask the rest of the group to critique this repeat demonstration. If time and materials permit, encourage more people to practice this skill.

4. *Application*

Ask participants to discuss how they will apply their new knowledge and skills when they reach home.

Find out if they perceive any problems in adopting the filter procedure (e.g., lack of funds to buy one, discouragement by other family members, etc.).

Seek their ideas on how to overcome these problems.

5. *Conclusion*

Ask a few participants to summarize the main points of the demonstration. Be sure that the following are emphasized:

- Always filter drinking water from ponds, streams, and other suspect sources.
- Use the special filter cloth or another fine mesh/weave cloth.

Seek any final questions from the participants.

Thank the participants and wish them good luck in preventing the dreaded dracunculiasis.

6. *Evaluation*

During the demonstration, you should be gaining feedback from the participants on the knowledge and skills they have gained. Be sure to **praise** correct answers and procedures. **Politely correct** any mistakes. Pay careful attention to this evaluation process now because you will not be able to follow every participant home to find out whether he or she has achieved the intended objectives.

Session 7

HYGIENE EDUCATION PLANNING AND PRACTICE

4 hours, 5 minutes

Objectives

By the end of this session, participants will have

- identified target groups for health education on guinea worm control,
- set appropriate health education objectives,
- designed an appropriate hygiene education session using stories, demonstration, and/or group discussion, and
- practiced this planned hygiene education session before an audience of co-participants.

Overview

After presenting the session objectives and explaining that the participants will have the chance to plan and deliver a brief hygiene education presentation, the trainer should initiate a discussion on selecting target groups for guinea worm education, outlining the process and components of a hygiene education presentation. Afterward, small groups will work to develop an educational activity aimed at their respective target audiences. In the evening, the groups are to deliver their presentations to the other participants, who will play the role of the target audience. After each presentation, feedback will be given based on a critique form provided to each participant.

Procedures

1. Introduction — *5 minutes*

Inform participants that during this session they will have the opportunity to plan and deliver a brief hygiene education program. Display session objectives on **Flipchart 7.1** and read through them.

2. Selecting Target Groups *20 minutes*

Explain that one of the goals of community assessment is to identify community groups that can play a major role in guinea worm eradication. Educational talks and programs can be prepared for such groups.

Ask participants to brainstorm a list of appropriate community groups that they know from their own work sites or from the case study. Record responses on flipchart paper.

Explain further that different groups will have different roles in the guinea worm control effort. Display **Flipchart 7.2**, as shown below, as an example of the types of roles for different groups and indicate that these can then become the topics for an educational program.

Team	Target Group	Topic
I	Mothers at Clinic	How to keep guinea worm ulcers clean and dressed and thereby keep infection out of ponds
II	Children at School	Helping infected/disabled people fetch water to avoid pond contamination
III	Elder Men at a Community Meeting	The need for community action to improve water supplies
IV	Farmers Cooperative	Importance of carrying safe, potable water to the farm

Note that the team numbers attached to each target group imply that participants will now be divided into four small groups to plan an educational activity aimed at their respective target audiences. Participants may either choose or be assigned to a work team, but be sure that they are evenly divided.

3. Culture and Language *15 minutes*

Brief Lecture

Comment briefly that in planning their health education programs, they should make use of their knowledge about the community and its culture gained through the practical community surveillance and study activities. Once they have learned about high-risk sections of the community, unhealthy water contact behaviors, and local beliefs about guinea worm, this information should be used to make any talk relevant to the local setting.

An important concern is language. French and English may be the national language of many countries, but the local citizens may not understand those languages. Similarly, not all Peace Corps volunteers are fluent in the local languages. Health education is not simply a matter of directly translating words about health into another language. We must also be able to communicate concepts that local people understand. Therefore, when planning actual communication activities in the field, the PCV should draw on the expertise of local staff to help plan and deliver educational sessions.

Trainees should be encouraged to learn local names for illness conditions, symptoms, and parts of the body. They should remember that people define illness experiences differently in each culture. The Western medical definitions of "disease" are often quite different from local concepts of "illness."

4. Setting Objectives — *20 minutes*

Recall for the group that the ultimate goal of hygiene education is to promote healthy behavior.

Review previous lists of behaviors that the participants have developed in relation to promoting the various guinea worm control strategies. Note especially the importance verbs play in formulating behavior statements. Explain that these behavior statements form the basis of objectives for health education programs and sessions. As further examples, review the sets of objectives used for the different sessions of this workshop.

On **Flipchart 7.3** display and review the following components or characteristics of a health education objective:

- Who is the focus of the educational program?
- What behaviors should they adopt?
- When and with what frequency should the behaviors be performed?
- Where will these behaviors take place?
- How should the behavior be performed?

Also post the following example on **Flipchart 7.4** for critique:

> Community members (who) will filter their water through a clean cloth (what) each time they collect drinking water (when) by attaching the filter snugly to the drinking water pot (how) at home (where).

5. Planning a Presentation — *20 minutes*

Distribute **Handout 7.1**, which outlines the general stages of a hygiene education session or presentation. This will be used to guide planning when participants divide into groups later. Review each item on the handout thoroughly. Indicate that by writing out the points listed under each heading, participants are in reality scripting their educational presentations.

Remind participants to keep the educational level and circumstances of the audience in mind when planning. The typical rural audience will not be happy listening to a lecture. They will not carry pencil and paper to take notes. Therefore the talk should be quite limited in scope and time. A few basic, key facts should be presented and repeated. The use of a variety of educational methods not only makes the presentation more interesting to the audience, but also facilitates repetition.

Now distribute **Handout 7.2**, which lists points for critique or evaluation of a health education presentation. Review each point and the scoring scale. Note that later when each group delivers its presentation, the other participants will use this handout to guide their critique following the talk.

Finally, remind participants that health presentations (also commonly known as "health talks") have their limitations. They address the audience's need for information about a health problem and, if the audience is involved in discussing the points—interpreting the posters and reacting to the stories—they may also develop some new attitudes and problem-solving skills. But a total health education plan for a community should address all factors that influence behavior, including resources and social support, in addition to knowledge and information. Session 8 will look into the community action aspects of health education practice.

6. Planning Time — *90 minutes*

At this point participants should break into their teams. At least one trainer should be assigned to a team as resource person. The trainer does not have to sit with the team the whole time, but should check in frequently and be accessible if the team has questions.

Emphasize with the groups the need to be creative in designing a program. One can draw posters, use locally available materials for demonstrations, and tell stories that require no outside or special equipment. During this session participants should make their own visual aids with flipchart paper.

Finally, be sure the groups know they will be given only 20 minutes to present their talk.

Participants may wish to continue their discussions over dinner. They should reconvene shortly after dinner to give their presentations.

7. Health Education Presentations — *60 minutes*

The groups should reconvene in two separate rooms. Pair groups I and III and groups II and IV. Each group will have 20 minutes to present its program to the other group, which will assume the role of the designated target audience. Using Handout 7.2, the audience will then have 10 minutes to give feedback, praise, and suggestions for improvements to the group that presented.

One of the trainers should serve as moderator in each room to make sure that presentation and feedback times do not exceed the limits.

8. Wrap-up *15 minutes*

When the groups are finished presenting and critiquing, they should come back together briefly. Seek brief feedback from the participants about their experiences presenting the educational programs.

- Which aspects were easy and which were difficult?
- How would the experience be different when presenting to a real target audience?
- What will they do differently when they are back at their home sites?

Trainer Notes

- Be sure there is one trainer/facilitator assigned to each group to assist in planning. No formal lecture will be given on the planning process, so the facilitators must be very familiar with Handouts 7.1 and 7.2 in order to guide the group.
- This will be a long activity and participants will be tired by the end of the day. The group presentations should be fun and stimulating if they do not drag out too long. There should be a moderator in each room to make sure that a group does not talk longer than 20 minutes. If a group must be cut off, it should see this as part of the feedback process, that is, that the group did not plan properly.

Materials

Handouts

7.1 Hygiene Education Session Plan Outline

7.2 Checklist for Critiquing Presentations

Prepared Flipcharts

7.1 Session Objectives

7.2 Target Group Assignments

7.3 Components of a Health Education Objective

Other Needs

- Two rooms for evening presentations
- Plenty of flipchart paper and markers for homemade visual aids
- Health education materials from the national eradication program, for use by the participants

HYGIENE EDUCATION SESSION PLAN OUTLINE

This handout briefly outlines the sequences of a health education session. Use this to guide your planning. Fill in as indicated specific information about the session you are planning.

1. Title of the Session: ________________________________

2. Target Group: ________________________________

3. Objectives of the Session:

   Specify the health behaviors.

   Attach a time to each of the following items. Make sure the total does not exceed approximately 30 minutes.

4. Introduction: Time: ______

   Briefly outline below how you will start off the session.
   Greetings:
   Introduce Self:
   Explain Purpose:

5. Methods/Presentation: Time: ______

   - List the health education methods being employed in the order in which they will be presented.
   - Show the main points/issues (see objectives) to be covered by each method.
   - Indicate the time needed for presentation.

6. Feedback: Time:______

Describe ways by which you will get feedback from the audience on what they have learned and how they intend to apply it when they return home—list specific questions you will use and describe specific opportunities when you will observe participants demonstrate their skills.

7. Conclusion and Summary: Time:______

List specific summarizing statements that need to be made. You may make these yourself or encourage members of the audience to summarize the main points.

Questions from the Audience:

Summary Statements:

Appropriate Farewells:

Indicate where people may contact you for further help and information.

Total Time:______

CHECKLIST FOR CRITIQUING PRESENTATIONS

Tasks	Achievement			
	Full	Most	Part	Not
Planning 1. Topic Appropriate to Target Group				
2. Scope Kept Limited with Few Key Points				
3. Convenient Time Chosen				
4. Various Methods Used				
5. Materials Prepared in Advance				
Presentation 6. Participants Greeted/Cordial Atmosphere Created				
7. Topic and Presenter(s) Introduced				
8. Existing Knowledge Assessed				
9. Presenter(s) Spoke Clearly and Slowly				
10. Simple Language Used				
11. Visual Materials Visible to All Members of Audience				
12. Points Presented in Logical Order				
13. Opportunities for Involvement Provided				
14. Essential Points Repeated				
15. Audience Interpretation of Visual Aids Sought				
16. Time Limited to 20 to 30 Minutes				

Tasks	Achievement			
	Full	Most	Part	Not
Evaluation 17. Attention Level Assessed and Improvements Made				
18. Audience Feedback Sought Throughout				
19. Questions Asked on Specific Points				
20. Participants Asked to Summarize Points				
21. Availability for Individual Help Announced				
22. Presentation Closed on a Friendly Note				
Totals				
	X3	X2	X1	X0
Score				
Total Score				

Check the appropriate box for each item above. Add up all the checkmarks in each column in the "Totals" row. Multiply the number of checkmarks in each column by the number indicated to get a preliminary score. Add all of the multiplied numbers to get the "Total Score."

A score of 33-43 is fair.

A score of 44-53 is good.

A score of 55-66 is excellent.

A score below 33 is poor.

Note those areas scored "part" or "not" achieved and discuss ways of improving them for future presentations.

Session **8**

COMMUNITY EDUCATION AND ACTION *2 hours, 10 minutes*

Objectives

By the end of this session, participants will have

- identified elements of guinea worm eradication that require community-level change,
- discussed the different approaches to organizing community-level change in health and development, and
- outlined specific measures for ensuring community participation in program processes.

Overview

This session provides a brief introduction to the concept of community involvement and action as health education strategies. Participants will be guided to distinguish the different approaches to community change and determine which are most compatible with the definition of health education.

The trainer will introduce this session by reviewing the basic procedures involved in health education diagnosis (Handout 6.1) and emphasizing the need for community action for overcoming some of the behavioral antecedents. Participants' ideas will be sought for other appropriate kinds of activities for community-level intervention. A brief lecture will introduce the concept of community involvement and why a change agent must be aware of local norms and values. The group then will discuss the three types of community change (social planning, social action, and locality development) and their advantages and disadvantages. Then, the participants are to work at matching the different types of social groups in a community with the different community-level guinea worm control activities available in an effort to link each group with an appropriate role in the disease control process.

Procedures

1. Introduction ***15 minutes***

Begin this session by reviewing the health education diagnosis in Handout 6.1. Note that while an individual alone could overcome some of the factors under "educational diagnosis/behavioral antecedents" (e.g., lack of knowledge, skills), other factors necessitate communal action.

Comment that those improvements that require collective behavior and action fall in the realm of economic, social, or political resources that the individual or family alone cannot acquire. While an individual can filter his own drinking water, it is unlikely he could find the time, money, or strength to install a new well for himself. Although an individual can help her guinea-worm-disabled neighbor fetch water, she is unlikely by herself to have the influence to persuade local authorities to locate a water project in her village. These are examples of situations in which community-level organization, action, and education are needed.

Display the following examples of how the community can address some of the factors that influence health behavior on **Flipchart 8.1**.

- Predisposing factors: e.g., creating general awareness
- Enabling factors: e.g., raising funds for community wells
- Reinforcing factors: e.g., gaining the support of important local and regional officials

Seek participants' ideas about other appropriate activities for community-level intervention.

Display the session objectives on **Flipchart 8.2** and explain that during the next two hours the group will explore how local action and education can mobilize the community at large to solve guinea worm.

2. Understanding Involvement ***60 minutes***

Brief Lecture

Begin this section by commenting that community action succeeds when there is mutual understanding between the community and the change agent. Programs fail when change agents are impatient and unaware of community norms and values. Refer to Handout 3.2 again on some of the cross-cultural problems PCVs have had in defining their roles as community workers.

Programs also fail because the change agent lacks an understanding of the basic concepts of community change. List the following terms on **Flipchart 8.3** and ask participants to differentiate among them in about 15 minutes (an admittedly difficult task):

- community action
- community mobilization
- community organization
- community development
- community involvement
- community participation

Listen carefully for statements like, "**WE** will organize the community to...," "**WE** will mobilize the community to...," "**WE** will involve the community in..."

If someone says, "We (or I) will organize ...," ask whether this means that the community is disorganized. If someone says, "We (or I) will involve ...," ask whether community members are not already involved in running their own lives. Comment that our attitude toward the community is more important than any of the terms or jargon that we use to describe our work. We should be sensitive to the community's own agenda and its own natural ways of getting things done.

Explain that the point of these rhetorical questions is to emphasize that few if any communities are disorganized (with possible exceptions like a newly established refugee camp, but even these soon find some inner structure evolving). They have leadership and social structures and accepted patterns for getting things done. What may be disorganized or uninvolved or demobilized is ourselves, who as newcomers to the community, do not understand how things run. When "we" start to impose alien ideas and programs, we are undermining the existing strengths of the people we think we are trying to serve.

Note that communities sometimes appear disorganized and unresponsive when external agents come in with grand ideas about how to solve a health or social problem that has been determined from a mass of statistics churned out in the capital city. These external agents TELL the community to set up a committee. They tell the committee what is the problem in the community. Then they tell the committee how to solve that problem with technologies they have brought in from overseas. They tell the committee to go out and mobilize co-villagers to adopt the new technologies. After telling, they frequently depart leaving unfulfilled promises and suspicion, which has an impact on the next agent who comes in with new things to tell the people.

<u>Group Discussion</u>

Distribute **Handout 8.1** and give participants five minutes to read it.

Ask the group which of the three types of community change (social planning, social action, and locality development) involves telling people what is best to do (social planning). Note that this is often the norm, but does not have to be the case when there are dedicated change agents like PCVs living with the people in the community who can involve the local people in analyzing and solving their own problems through their own effort.

Now, lead the group in a discussion on whether and how we should make a guinea worm eradication program more like the other two approaches to community change. Use the following questions:

- Is it possible to avoid all elements of social planning?
- Can communities be completely self-sufficient in controlling guinea worm?
- What are the best approaches to seeking external resources for a village in need in the current social and political climate?
- In the context of a "mixed" strategy, how can we maximize local action?
- What do these different models say about the change agent's perspective on the nature of the client community?
- What perspective do we want to adopt to foster community involvement (e.g., rational, disadvantaged, self-motivated)?

Conclude this section by referring back to the discussion in Session 4 on community assessment. Note that we began that discussion by stating the need for mutual understanding between change agent and community. Community assessment, when it is conducted by the change agent together with community members, fosters the level of understanding that establishes the foundation for further involvement of the community in solving its own problems.

3. Mechanisms for Involvement — *40 minutes*

Distribute **Handout 8.2** on the stages of community action and involvement. Review these with participants. Note that the success of community action depends on a strong local organization. New or existing committees, associations, or councils may serve this purpose.

Establishing a new committee is a special challenge, and yet one of the first things many change agents do when they reach a community is attempt to organize some sort of health or development committee. Seek participant opinions on the desirability of this action and possible alternatives.

Explain that time, structure, and ownership are reasons why special committees sometimes fail, as described briefly below. Post the <u>underlined</u> portions on **Flipchart 8.4**.

- Most community members already belong to various formal and informal organizations. <u>It takes extra time to participate</u> in yet another committee.

- When new committees are organized, they often take on the structure with which the change agent is familiar—elections, representatives, votes, motions, minutes, and so on. The traditional community structure and management of organized groups in the community may be totally different. For example, it may be considered correct for elders to state the decisions for the group. The outsider may think that this is "undemocratic," when in fact this decision may have been preceded by a long debate that the elders guided until a consensus was formed. The running of new, "modernized" committees may seem confusing or even offensive to community members.

- Finally, when the very idea for forming a committee comes from the change agent, people often feel that the committee is "his" committee or "her" committee, not "our" committee. People may join the committee to be polite to the visitor, but soon may drop out because they do not feel that the committee is their own.

Brainstorming Session

Now guide participants to brainstorm for about 10 minutes to list all the formal and informal groups that they know in the communities where they work. Record answers on flipchart paper. The groups may vary from traditional councils of leaders to informal clubs. There are groups associated with religion, age, sex, occupation, section of town, ancestry, school, and others.

Recall the various community-level tasks for guinea worm control mentioned during the introduction to this session by posting Flipchart 8.1 alongside the one containing the community groups list.

Now ask participants to match existing community groups with community-level guinea worm control activities. Use the following questions to guide discussion. Note that the questions imply that certain groups have characteristics that enable them to handle certain tasks.

- Which existing groups could handle aspects of the program as a normal part of their usual responsibilities?

- Which groups have resources to communicate with large or specialized segments of the community?

- Which groups have access to finances, materials, and skills to carry out certain aspects of the program?

- Which groups have the power and influence to encourage others to take up guinea worm control as a priority?

- Which groups have a history of success on community and group projects?

After the list has been formed, discuss the characteristics of each group that make it appropriate for the particular task, e.g., resources it commands, leadership roles, particular population subgroups it can influence, history of accomplishment, and so on.

Comment that it is not enough for us as outsiders to identify possible roles for community groups in guinea worm control. They must make the decision to participate themselves.

Lead a brief discussion with participants to think of appropriate ways of approaching community groups, helping them become aware of the problem, and encouraging them to take part voluntarily. Several points should be raised, including the need to identify and work through group leaders and to meet the group members on their own terms and schedule.

4. Wrap-up *15 minutes*

Summarize by reminding the participants that during this session they have identified the aspects of guinea worm control that would require community-level change and the organizations already existing within the community that could take up the task.

Have them reflect for a minute on the approach to planned change they would adapt when they return home.

Trainer Note

This session demonstrates the need for trainers to remind participants to bring all handouts with them to each session. As before, make sure participants have folders or binders in which to keep their handouts.

Materials

Handouts

8.1 Three Models of Community Change

8.2 Stages in Community Action

Prepared Flipcharts

8.1 Community Roles

8.2 Session Objectives

8.3 Community Involvement Terms

8.4 Why Committees Fail

THREE MODELS OF COMMUNITY CHANGE

Social Policy Planning

(Change agent as expert, planner)

Planners abound in the modern world—health planners, city planners, development planners, educational planners, financial planners; the list goes on. These planners usually work in the public domain and have at heart a desire to make life "better" for people. Their concept of "better" is often bound in the current political philosophy of those in power. They claim to have an "objective" perspective on community needs. They draw heavily on "experts" in the field to determine what is the "real" problem facing the community and what are the "best" solutions. Community members, being rational maximizers of benefits, will see the logic and desirability of these "best" solutions and adopt them.

Sometimes such a broad, objective perspective and scope of work is useful when dealing with the problems of large cities or regions, as it avoids falling prey to the peculiarities and prejudices of smaller units. At the same time, when needs, culture, and social structure vary over a wide region and the success of a program depends on adapting to these variations, social planning can be found wanting.

Social Action

(Change agent as organizer, activist)

A basic premise of social action is that there are various subgroups within a larger polity. Some of these subgroups have greater access to power, resources, and privilege than others. These divergences themselves are seen as a cause of the problems faced by the less advantaged subgroups.

Social action strategies therefore involve efforts to gain a more equitable distribution of power and resources. These strategies can range from negotiation to confrontation. Leadership must be strengthened within the disadvantaged group so that it can bargain confidently with the advantaged. Demands must be clearly delineated. Efforts to find allies within the advantaged groups are another component of the strategy.

Locality Development

(Change agent as facilitator, encourager)

Locality development starts from a belief that communities have internal resources and motivation to improve themselves. This model of change acknowledges that community leaders are capable of articulating and prioritizing their most pressing (felt) needs, and with guidance and encouragement, develop their own appropriate solutions to these problems using local labor, finance, skills, and materials.

The change agent emphasizes the learning of problem-solving mechanisms rather than the solution of one particular problem, so that the community will develop the capacity to address other needs by itself in the future when the change agent inevitably withdraws.

Reference

Rothman, J. 1977. Three models of community organization. In Creating Social Change. Zaltman, Katler, and Kaufman, eds. 472-501.

STAGES IN COMMUNITY ACTION

1. Entry

The change agent must first move into the community. He or she then finds local leaders and learns the boundaries of the community and key geographical features. The change agent must begin forming relationships with a variety of community members.

2. Establishing Identity

Community members will want to know why the change agent is present. They may have seen people come from outside before and will therefore have certain expectations about what the change agent intends to do and how he or she will go about doing these things. It is important therefore that the new change agent establish his or her identity quickly so as to avoid confusion and false (positive or negative) expectations. The change agent must be honest about what he or she can and will be able to do to assist the community. When using the locality development approach, the change agent must be sure to clarify that he or she is not coming with solution (and funds) in hand, but is there to help the community develop itself. This is a difficult identity to establish, and one will need to remind people constantly about one's purpose in the community.

3. Involvement

From the beginning the change agent must involve the local people in the problem-solving or community development process. It is necessary to identify existing groups that have community improvement on their agenda and work with such groups. It may be necessary to work with several groups in order that the interests of all (women, youths, minorities, etc.) be addressed.

4. Problem Diagnosis

Problem diagnosis proceeds through three stages. Together with the groups noted above, the change agent needs to begin first by identifying the major problems and needs of the community as community members themselves see them. This can be accomplished through group discussion, individual interview, observation, and review of available records and documents. Community self-study should be planned.

Community members themselves can design a simple questionnaire that they will administer to neighbors. As a group they can visit and observe conditions in the community such as water supply, sanitation, housing conditions, and the market. Community members can be encouraged to create a map, either on paper or on the ground using real objects of the community and then talk about the social relations, economic conditions, and other points of interest depicted on the map.

A discussion of why the problems exist and what has been done in the past to address them is the second phase of diagnosis. Why have past efforts failed? What resources are needed to solve the problems?

The third phase of problem diagnosis is setting priorities. No community or agency has the resources to tackle all problems at once. Community members need to discuss what is feasible. Which problem affects the most people, or a particularly vulnerable segment of the population? For which problem are their existing resources? In solving which problem will the community receive the most benefit? A short list of three or four of the most important problems may be drawn. Then the community members can decide which to tackle first, second, and so on. Ideally a problem that can actually be solved should be selected first so that the community will experience success early on and be motivated to continue solving other problems.

5. Planning

More details on the planning process will be presented in another handout in the next session. Community members must be involved in deciding what the program's objectives are, which strategies should be used, where resources can be found, and who will take responsibility for which actions and tasks.

6. Evaluation

The community, through an existing organization or a special development or planning committee, must meet regularly to assess progress of the project. Decisions must be made to address any difficulties. Community members must collect information, as they did with self-study, showing evidence that the project is working. They must themselves decide if the outcome of the project is of an acceptable quality and level.

7. Termination

Most change agents move on once the community has made some progress in solving its problems. The way one leaves a community is just as important as how one enters. The change agent must be certain that community members are fully aware of how they can organize themselves to solve future problems. They must know where they can look for future resources both inside and outside the community. In short, the change agent must meet with the community a final time and ensure that community confidence and competence is high.

Session **9**

PLANNING AND MANAGING LOCAL ACTION

4 hours, 40 minutes

Objectives

By the end of this activity, participants will have

- discussed local guinea worm program management problems and their solutions,
- identified the components of a local guinea worm control action plan, and
- developed a realistic outline of a plan that they might implement on returning to their community.

Overview

This session starts by building a definition of management. Participants are to review and offer solutions to guinea worm program management problems described in case studies. Then, because planning is one of the key functions of management, participants will be introduced to the planning process. Participants will work individually or in small groups to develop actual plans they can implement back home, or alternatively develop model plans for a target area of Apata Village, the community described in the background case study.

Procedures

1. Introduction — *15 minutes*

Explain to participants that this session will be primarily a time for them to plan how they will implement what they have learned back in the field. Make sure that participants bring all handouts and reference materials with them for this session.

You may wish to post flipcharts from some of the group discussions for participants to review as needed.

Display the session objectives on **Flipchart 9.1** and state that the ultimate goal of this session is to produce a draft plan, but that first we will look at the broader area of program management and see the need and context for planning.

A draft plan will be developed by all participants by the end of this session. A copy should be submitted to the trainers, who will make suggestions.

2. Management Problem Solving *80 minutes*

Brainstorming Session

Ask participants to define the term "management" in a few words. All responses should be recorded on flipchart paper. This should take approximately five minutes. Post all flipchart pages and guide participants to look for common themes.

Next post the following ideas from the WHO manual *On Being in Charge* as **Flipchart 9.2.** Ask participants to discuss how these concepts relate to the ones they have just derived through brainstorming.

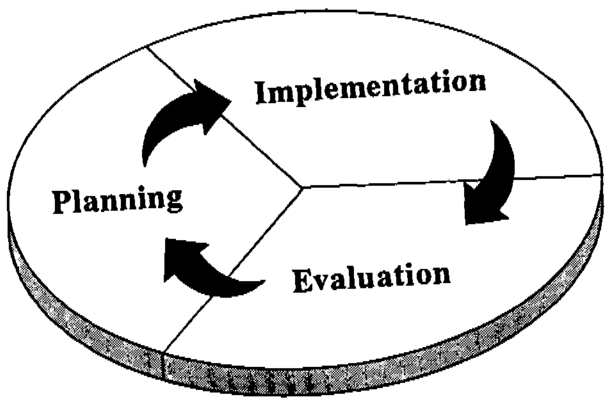
- Management is getting things done.
- Management is getting things done through people.
- Management is the efficient use of resources.
- Management is making efficient use of resources and getting people to work harmoniously together to achieve objectives.
- Management is making decisions.

Repeat the last item on the flipchart above, "Management is making decisions," and then display **Flipchart 9.3** as seen below and review the various issues that need to be decided by program managers.

Management is accomplished by deciding
■ WHAT is to be done
■ HOW MUCH is to be done
■ WHERE it is to be done
■ WHO is responsible for doing it
■ WHAT resources are needed
■ WHEN it is to be completed

Distribute **Handout 9.1** as an example of how these decisions may be applied to guinea worm control and seek comments and questions from the participants.

Explain that there are three main functions of management: planning, implementation, and evaluation, as shown in **Flipchart 9.4** below. Note that the management decisions shown in Flipchart 9.3 must take place during each of these three functions. If these decisions are not made during planning, problems will arise during implementation. If these decisions are not made during implementation, it will be difficult to achieve the results desired during evaluation. If these decisions are made during evaluation, however, they will aid in planning continued or new programs.



Case Studies

Distribute **Handout 9.2**, the management problem case studies. Divide participants into five small groups. Display the following group tasks in **Flipchart 9.5**:

- Select a reporter/recorder
- Review the five case studies

- For each case pinpoint exactly what went wrong in the management process
- Make suggestions on how the problems can be solved and prevented from recurring
- Complete deliberations in 30 minutes

When the participants are reassembled in the large group, ask the recorder from one group to present the group's comments on the first case. Request other groups to comment on the observations and suggestions. Ask another group to present the second case and so forth. Limit presentations and discussion of each case to around eight minutes.

3. Planning Procedures — *20 minutes*

Distribute **Handout 9.3** and review the steps involved in the planning process. This handout will serve as a guide for developing the draft plans and time lines. Also post **Flipchart 9.6**, as seen below, which contains the major headings of the plan outline as well as reference to the relevant previous sessions of this workshop.

Plan Outline

1. Title
2. Problem Statement (S3, S5)
3. Objectives (S7)
4. Community Description (S4)
5. Community Involvement (S8)
6. Control Strategies (S2, S3)
7. Health Education (S6, S7, S8)
8. Resources (S3, S4)
9. Implementation Plan
10. Evaluation

Note: S3 denotes Session 3, S5 Session 5, and so on.

Together with the participants read over the outline and try to answer any basic questions. Be sure to make the following points:

1. The title should reflect the topic, locality, and target group.
2. The problem statement should draw on both epidemiological (surveillance) and community assessment data.
3. Objectives should include both statements about health behaviors (health education outcomes) as well as improvements in health status (reduction in prevalence of guinea worm).
4. Information about who is affected, where they live, and pertinent aspects of their social, cultural, and economic life should be mentioned under community description.
5. Community members should be involved in all stages of programming, from initial data gathering through program evaluation. State clearly how this will happen. Are there existing groups or councils or will a new planning committee be needed?
6. Specify the exact control strategy to be used in the plan. Several plans may be needed if more than one strategy is to be applied. Justification is needed for why a particular strategy is appropriate for the geographical, epidemiological, economic, and social realities of the community.
7. Link specific health education methods with the chosen control strategy using educational diagnosis. Identify specific subgroups in the community (schoolchildren, women, farmers, and so on.) that should be targeted for educational activities.
8. Effort should be made to use local human, material, and financial resources where available. Also, be aware of resources provided by the national eradication program and other donors. List these under the appropriate headings of "internal" and "external."
9. Use the charts provided to spell out the step-by-step procedures for carrying out the plan. These charts should be posted on the office wall for easy reference and program monitoring.
10. Process evaluation can be accomplished by referring to the time line in the plan. A guide to measuring the results of the program lies in the statement of objectives. Changes in behavior should be measured after appropriate health education interventions have taken place. One needs a realistic understanding of the disease process to plan appropriate times to evaluate change in disease prevalence.

Since trainers will be working with each individual or team, it will be unnecessary to give formal instruction at this time. A review of the plan outline will suffice as long as all trainers/facilitators are familiar with the planning process and will be on hand to answer questions during the subsequent planning period.

Note that participants may not have all the information on hand to develop detailed final plans. Where such gaps exist (e.g., data concerning prevalence, community beliefs, and local organizations), participants should simply write out the steps they will take in the field to gather the needed information. They should also draw on national and local information presented during Session 3.

Finally, it may be most appropriate for participants during preservice training to use the Apata Village case study and supportive data to develop model action plans. Groups could be assigned to tackle a problem in different sections of the community (e.g., North Ward or the farm hamlets). The case study can also be used for in-service training if the trainers feel that to be most appropriate for the level of community experience of the trainees.

4. Planning Period ***120 minutes***

Display on **Flipchart 9.7** the following tasks of the planning period:

- Develop a draft plan based on the community where you work, or a section of Apata.
- Write at least something under each heading in Handout 9.3, and do not get bogged down in the details on only one or two sections.
- Include a rough estimate of the major activities and the time they will take.
- Draw the time lines on flipchart paper headed with the project title.
- Display time lines during the final evaluation session at the end of the workshop.

Note: Plan a lunch break during this period so that participants will have more than two hours to work on this task.

5. Wrap-up ***45 minutes***

Poster Session

Participants should be given about 15 minutes to walk around the room and examine all the time lines.

Discussion

Call the group back together. Ask for feedback concerning the time lines. Are they realistic and comprehensive?

Review the session objectives and ask participants to comment on their perceived ability at this point to plan. Explain that it is not possible in this short workshop to pursue the issue of planning in great detail. The main concern is that participants realize that planning and management are necessary and that they recognize the steps involved.

Indicate that Peace Corps and national eradication program staff will be visiting participants in the field from time to time and will follow up on the development and implementation of plans. Remind trainees to submit draft plans for comments and feedback. Encourage participants to make good use of the reference and handout materials provided to help them develop more comprehensive plans.

Trainer Notes

- An adequate number of trainers/facilitators must be available to assist all individuals or groups.
- It will be the responsibility of each trainer/facilitator to ensure that his or her trainees have a time line chart and a rough handwritten draft to submit prior to the beginning of the final session.
- It is likely that participants will work during the lunch break. In that event, the wrap-up of this session need not begin until the afternoon.
- Ideally, trainers should coordinate with Peace Corps and national guinea worm eradication program staff to provide follow-up consultation on planning and implementation with trainees. Copies of draft plans developed at the workshop can be forwarded to these persons for comment and assistance.

Materials

Handouts

9.1 Management Decisions

9.2 Management Case Studies

9.3 Outline for a Local Control Plan

Prepared Flipcharts

9.1 Session Objectives

9.2 Definitions of Management

9.3 Management Decisions

9.4 Functions of Management

9.5 Small Group Tasks

9.6 Plan Outline Headings

9.7 Planning Tasks

Other Needs

Flipchart paper and markers for participants to draw time lines

Facilities to photocopy draft plans

References

It is suggested that trainers have on hand (and ideally provide copies of to each participant) the following documents:

World Health Organization. 1980. On Being In Charge: A Guide for Middle-level Management in Primary Health Care. World Health Organization.

USAID. 1991. Community Based Initiatives to Eradicate Guinea Worm: A Manual for Peace Corps Volunteers. Prepared for Peace Corps by the Vector Biology and Control Project, USAID.

MANAGEMENT DECISIONS

Management is accomplished by deciding....

1. WHAT is to be done. This concerns the selection of strategies. For example, are filters to be produced and distributed? Will the community be encouraged to dig wells? Will certain health staff be trained to administer Temephos in local ponds? Also, what health education methods will be employed to match the technical strategies?
2. HOW MUCH is to be done. This requires a knowledge of the size of the population in need. How many filters need to be produced? How many wells are required to serve the standard number of people per water point? How many pupils need to receive educational pamphlets?
3. WHERE the work is to be done. Is there a clear social and geographical definition of the target community? Will health education take place at school, in the market, in the town hall?
4. WHO is responsible for doing the work. What is the role of Peace Corps volunteers, community members and leaders, volunteer village health workers, other health staff, workers in other agencies?
5. WHAT resources are needed, both for the technical inputs and the health education activities. How much filter cloth is required to serve those in need? How many bags of cement will it take to line the well? How many village health workers need to be trained to distribute filters? What external expertise and materials are needed?
6. WHEN work is to be completed. What is the project time line? Are the steps spelled out in logical order? How long will it take to complete each step? When will the major interventions be completed? When should we start expecting to see changes in knowledge, behavior, and health status (particularly reductions in guinea worm disease)?

MANAGEMENT CASE STUDIES

Below are five case study scenarios regarding local guinea worm program management. Review them and determine how the problems they present could be solved.

1. The annual case searches conducted throughout the country have been used to help target villages for interventions like improved water supply. Local, state, and national task forces use the results to plan for distribution of scarce resources. The need for an accurate list of villages where guinea worm is endemic is crucial to the process.

   During a review of last year's annual house-to-house case search you discover that village summary reports from 30 villages in one zone of the LGA contain an exaggerated number of houses by as much as twice to 10 times the actual figure. You learn later from villagers that the team assigned to that zone (one environmental health officer [EHO] and one schoolteacher) visited only five of the villages, but inquired about the size and number of guinea worm cases in the other villages from people in the settlements they did visit.

   Not only did these two staff members collect their full stipend for the exercise, but there were also reports that they collected money from villagers. This money was said to form initial contributions needed for community wells. Ironically, no wells have been planned as yet by the LGA task force for that zone. The mother of the teacher/team member in question is a cousin of the LGA council chairman and lives in one of the five villages actually visited. The EHO hails from another part of the state.

2. Normally, health staff on the guinea worm eradication task force visit villages where improved water supply systems (wells, for example) are to be sited well in advance of the start of construction. This is necessary to mobilize community involvement in the process, educate villagers on the value of using the new (safe) water source, and train villagers who will take responsibility for maintenance.

   Several national and international agencies are providing the improved water supplies by dividing up the states and LGAs among themselves. Agency X is providing the wells in your LGA. Agency X does not undertake the construction directly but contracts the work to local businesses, and then supervises the activity. Because the contractors are anxious to get their money, they have pressured Agency X to provide start-up fees and have begun construction without consultation with the LGA task force.

   On a regular visit to one of the guinea-worm-endemic villages in your LGA, you discover the construction contractor busy at work on a well. Not only does the contractor's head start surprise you, but you realize that the plans for that village centered on filters first followed by a rainwater harvesting scheme because of the geological problem of inadequate groundwater. On inquiry you discover that the contractor has work teams currently active in 15 other villages.

3. The LGA task force has just received a shipment of filters to distribute in targeted villages. The task force has planned a month-long program of village visits during which education/demonstration will precede actual distribution. You reach the health office on Wednesday, the first morning, only to discover that the vehicle assigned for the job has taken the local government secretary to the state capital to attend a meeting. On the second day you come to the office expecting that the vehicle would have returned, only to discover that the LGA secretary has proceeded from the capital to his hometown at the other end of the state for a long weekend.

   On Monday you reach the health office and find that a team from the state ministry of health has arrived with yellow fever vaccines and has commandeered all vehicles for the week to vaccinate all villagers in a section of the LGA bordering on an area where a yellow fever outbreak was reported some months ago.

   On the following Monday you decide to complain to the LGA council chairman. On reaching the office you find that he is not there, but has taken the vehicle in question to his farm to collect cassava.

4. The national guinea worm eradication program is supposed to integrate with local primary health care efforts. Eight months ago, before your arrival, the LGA task force went to each of 80 guinea-worm-endemic hamlets and told residents to choose a VHW for training. At the same time the LGA PHC coordinator recruited and trained VHWs from 70 hamlets, 25 of which overlap with the guinea-worm-endemic settlements. Those 25 now have two VHWs. The guinea worm coordinator and the PHC coordinator have been rivals since high school and refused to collaborate on the VHW training.

   Now you discover that only 40 of the guinea worm VHWs are submitting monthly reports, and these are usually two months late or more. The VHWs trained for the PHC program have slightly better staying power, as only 8 have dropped out.

   The guinea worm VHWs are complaining that they are not getting paid even though there is no policy to pay volunteer health workers. This is one reason why some stopped working. Others complained that they did not understand the forms, and some said they were just too busy. The monthly reports are needed for targeting and monitoring distribution of filters, and this intervention cannot proceed until the VHW situation is properly handled.

5. You have been diligent in making sure that EHOs for each PHC zone in the LGA collect the monthly VHW report forms and submit them to the assistant guinea worm coordinator, who has been designated to compile and forward LGA monthly guinea worm reports to the state task force. At a state task force meeting you are confronted by the state coordinator, who says that she has received no reports from your LGA in the past three months.

On returning, you discover piles of forms in the bottom of a cupboard in the assistant coordinator's office. After sorting out the forms together with the coordinator and assistant by zone and month, you find that they are only about 70 percent complete for any given month in any zone in the LGA. When you ask the assistant coordinator what happened, he says that he ran out of summary report forms some time ago.

You ask to see the files of previous submissions and are stunned to realize that the assistant coordinator never kept a copy of the monthly summary forms before sending them to the state task force. At the next LGA task force meeting you raise the issue of the monthly forms. There seems to be a consensus among the staff that they do not understand the rationale for all these forms. They say, "We know which villages have guinea worm, so why bother with all this paperwork?" They complain that they do not always find the VHW in the village when they come to collect the forms and since they are busy on many programs they do not have time to continue visiting the villages that have not submitted.

OUTLINE FOR A LOCAL CONTROL PLAN

1. Title

Each program needs a title that reflects the targets and activities being undertaken.

2. Problem Statement

In this section basic surveillance data are called for. If this information is not yet available, indicate what is already known. Then outline the steps that will be taken to gather up-to-date information on disease prevalence and related factors. Mention the specific data gathering methods that will be used—observation, surveys, focus groups, in-depth interviews, and so on.

A description of the nature and extent of the guinea worm problem in the community is needed. Recent prevalence data are desirable that break down the problem by age, sex, and section of the community. Ideally prevalence figures by type of water source used would be compiled to aid planning.

Information on the current status of water supply in the community is needed. What are the current water sources? Are there any safe sources? What proportion of the community has access to safe water?

Finally, include any factors that may influence the success of the program, such as local beliefs, past community development experiences, availability of local resources, and access to external resources.

3. Objectives

Set objectives within the framework of one or two years.

Specify first the desired outcome of the program in terms of health or disease status. In this case, what target is being set for guinea worm prevalence one and two years hence?

Additional objectives can focus on program output. This includes implementation of control strategies. How many filters will be produced, distributed, and used within the time period? How many community wells will be dug? and so on.

Output is also related to health behavior. Health education objectives may also be spelled out here and/or under the special heading for health education activities.

Remember, objectives must be specific and measurable and state who, what, when, how, and where.

4. Community Description

Following from the statement of the problem should be a more detailed description of the community. Include sketch maps, description of relevant history, social structure, economic foundation, local amenities, climate and environment, and so on. Use community assessment data.

5. Community Involvement Mechanisms

Planning should include the community at all stages. Indicate here how community involvement will be achieved. What specific organizations and individuals will undertake what roles in planning, implementation, and evaluation. How will decisions be made? How will the community oversee and manage the control process?

6. Guinea Worm Control Strategies

Methods to eliminate guinea worm range from the short to the long term and require both individual and community action. Among the various control options are probably three or four that have been chosen for the national program. Which of these are feasible in this community? Describe how these will be adapted to suit local needs.

Describe the details of how the strategy will be implemented in the community. If, for example, cloth filters are being used, indicate where the cloth is coming from, how local funds will be raised to buy it if necessary, how it will be produced locally, and methods for distribution. Link these details with the health education activities below.

If a community well is planned, list the steps involved, including design, siting, gathering funds and materials, actual construction, education on use (describe below), and procedures for continual maintenance.

7. Health Education Activities

Link health education with the chosen control strategies. Include a health education diagnosis diagram for major target health behaviors (filtering, protecting sources, utilizing wells, etc). State health education/behavior objectives clearly. Develop a hygiene education session plan outline as an attachment for each major activity.

8. Resources

Outline the human, material, and financial resources required to undertake the project and whether these will come from within the community or from external sources (government, voluntary agencies, etc.). This can be made in simple grid format as follows:

Guinea Worm Control Program Resources

Source	Community	External
Type Human		
Material		
Financial		

Human resources may include basic labor and also more skilled manpower, like the assistance of a geologist. It would be helpful to subdivide accordingly.

9. Implementation Plan

This section can be outlined in the form of two charts. One is a responsibility roster and the other a time line (also called Gantt chart). Responsibilities should be listed in logical time sequence. The draft plan may not include specific persons' names, but a final community plan should specify exactly who will do what so that in the process of monitoring, people can be held accountable for what they agree to do to help the community.

Chart 1: Guinea Worm Control Responsibility Roster

Activity	Resources Needed	Responsible Person(s)	Time/Date Completed

The time line chart should outline all major activities and components thereof. The time span should be in one- or two-year periods with demarcations in months, beginning from the time one starts work in the field. Ideally the actual months would be indicated instead of numbers. A line indicates where the activity starts and ends. Lines that end with a vertical bar show where the activity terminates. Activity lines ending in arrows indicate ongoing activities. A few examples are shown below.

Also note that months of guinea worm transmission should be marked (*in this case). This will help ensure that planners initiate certain crucial activities before the season begins, e.g., early distribution of filters.

Chart 2: Time Line for Guinea Worm Control Implementation

Month 1 2 3 4 5 6* 7* 8* 9* 10 11 12

Activity

Baseline Surveillance ----------| ■

Filter Production --------| ■

Filter Distribution ----------- ▸

Education on Filter Use ------------------------- ▸

etc.....

Note that a line ending in a block ■ means that the activity concludes that month, while lines ending with an arrow indicate an ongoing activity.

10. Evaluation

Surveillance sets the baseline for evaluation, and objectives spell out the evaluation targets. What remains to be done here is to describe how, when, and what information needs to be gathered to determine whether the program has been successful.

Two general types of information are needed: program process and program outcome. Process can be evaluated by keeping careful track of the responsibility roster and time line through regular meetings. In this way divergences and problems can be identified and corrected quickly. Therefore, describe the exact mechanism that will be used in the community to monitor progress.

Second, use the following chart to plan out evaluation data gathering that will help determine program output and outcome.

EVALUATION PLANNING CHART

Information Needed	When It Should Be Gathered	Data Collection Methods	Who Will Gather
No Filters Distributed	Month 6	Sample Survey, Health Worker Records	VHWs
Filters in Use	Months 6-9	Observation	VHWs
Knowledge of GW Cause	Month 12	Sample Survey	University Students
GW Prevalence for Year	Month 12	Sample Survey	Health Staff

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.etc.

Session 10

WRAP-UP AND EVALUATION *1 hour, 25 minutes*

Objectives

By the end of this session, participants will have

- given verbal feedback on the workshop to trainers,
- identified follow-up needs and resources, and
- completed a workshop evaluation form.

Overview

Participants will give verbal and written feedback about the organization and quality of the workshop. Trainers will identify resource people who can assist with follow-up activities and plan implementation. The need to share what was learned at this workshop and to work as a team with people back home to solve the guinea worm problem will be stressed.

Procedures

1. **Introduction** *5 minutes*

Display the session objectives on **Flipchart 10.1**. Ask participants if there are any other matters they wish to discuss in the remaining time and add these items to the flipchart.

2. **Action Back Home** *10 minutes*

Note that the time available for planning during the workshop was very brief. In fact, in order to develop comprehensive plans, participants will need to go home and gather more specific data about their communities and the guinea worm problem.

Ask participants to mention some of the different types of data they still need to gather and record these answers on flipchart paper.

Encourage participants to identify specific forms of follow-up help they may need from the trainers and others in order to implement what they have learned at this workshop. Jot these points on flipchart paper.

Remind the participants that in Session 3 some of the key resource people in the national guinea worm eradication program were identified. They and their communities should be in contact with such people on a regular basis.

3. Workshop Evaluation *45 minutes*

Distribute **Handout 10.1**, the workshop evaluation form. Allow participants 20 minutes to complete the form and submit it.

Display the workshop goals flipchart from Session 1. Review the goals and the items on the form briefly and ask for general comments as follows:

- Aspects people liked
- Problem areas
- Major gaps or needs not met

Finally, discuss any additional agenda items the participants mentioned at the beginning of the session.

4. Closing *25 minutes*

At this point thank the participants for their hard work during the sessions. Indicate that this is only the beginning. Peace Corps staff will follow up with participants to guide them in developing and implementing guinea worm eradication activities.

Thank all persons who assisted in organizing the workshop and any special guests who attended and helped.

Give the participants a chance to make final comments.

Certificates of attendance may be given at this time. These are particularly important if community counterparts of the Peace Corps volunteers are in attendance, or if the workshop design has been used primarily with local/district health and development workers.

If there are any special guests present, allow them an opportunity to speak briefly.

Materials

Handout

10.1 Workshop Evaluation Form

Prepared Flipchart

10.1 Session Objectives

Other

Certificates of attendance

WORKSHOP EVALUATION FORM

Section A: Goal Attainment

Circle the appropriate number to indicate the degree to which you are now able to do the following:

1 = very well; 2 = well; 3 = adequately; 4 = somewhat; 5 = poorly

1. Explain the symptoms, cause, prevention, disability, and treatment for guinea worm	1	2	3	4	5
2. Describe global and national guinea worm eradication policies and programs	1	2	3	4	5
3. Identify a role for PCVs in local guinea worm eradication efforts	1	2	3	4	5
4. Define the process of community assessment in guinea worm control	1	2	3	4	5
5. Differentiate surveillance procedures	1	2	3	4	5
6. Analyze and report surveillance results	1	2	3	4	5
7. Design community surveillance instruments	1	2	3	4	5
8. Design and deliver appropriate individual and group health education programs for guinea worm control	1	2	3	4	5
9. Outline steps for involving communities in guinea worm eradication	1	2	3	4	5
10. Develop a local plan of action and time line for guinea worm control	1	2	3	4	5

Section B: Workshop Design

1. What have been your most positive experiences at this workshop?

2. What are the major problems with the workshop, and your recommended solutions?

3. Make specific comments on the following:

   a. Workshop length

   b. Workshop site

   c. Facilities

   d. Accommodations

   e. Food

   f. Quality of trainers/facilitators

g. Availability of trainers for help

h. Handouts and reference materials

i. Visual aids

j. Overall workshop content

k. Workshop methods

l. Supplies and materials

m. Sequence of sessions

n. Any other comments