



Date: August 27, 2004



From: WHO Collaborating Center for  
Research, Training and Eradication of Dracunculiasis

Subject: GUINEA WORM WRAP-UP #145

To: Addressees

## Detect Every Case of Guinea Worm Disease within 24 hours, Contain Every Worm!

### FRANCOPHONE COUNTRIES REDUCE CASES BY -58% IN JANUARY-JULY

Benin, Burkina Faso, Cote d'Ivoire, Mali, Mauritania, Niger, and Togo held their annual Program Review in Accra, Ghana on August 18-20, 2004. The National Program Coordinators of Burkina Faso, Cote d'Ivoire, and Togo's Guinea Worm Eradication Programs also attended the semi-annual national Program Review for Ghana's program, which was held in Accra on August 16-17 (see below). Reports presented at this review show that the francophone countries have reduced their reported indigenous cases of GWD by -62% (from 795 to 303 cases) between January-July 2003 and the same period of 2004. Considering only the villages where the programs intervened in 2003, they reduced GWD there by -82% so far this year (Table 1). The status of programs and interventions for these eight countries are summarized in Table 2.

**Mali** reported 46 indigenous cases (and one case imported from Niger) from 27 villages in the first seven months of 2004, vs. 106 indigenous cases in the same period of 2003, a reduction of -57%. Transmission was contained in 37 (79%) of the 47 cases reported. Of the three highest endemic districts, Gourma Rharous has reported no cases so far this year, Ansongo has reported an increase in cases resulting from improved surveillance this year; and Gao is the weakest of the three. President Amadou Toumani Toure plans to meet with the minister of health and other program staff about Mali's GWEP very soon. An annual national review is planned for early 2005.

**Togo** reported 154 indigenous cases (and 37 cases imported from Ghana) from 79 villages in January-July 2004 vs. 459 indigenous cases during the same time last year, a reduction of -66%. Transmission was contained in 122 (64%) of the 191 cases reported. Sixty-one cases were contained in case containment centers. Districts with case containment centers reduced cases by -73% vs. other districts' reductions of -42% in January-June.

**Niger** reported 62 indigenous cases (and 4 imported cases, 2 from Nigeria and 2 from Mali) in 28 localities, almost all of them in Tillaberi Region, in January-July 2004, compared to 44 indigenous cases in the same period of 2003, for an increase of 41%. Transmission was contained in 52 (79%) of the 66 cases reported. Eighty-eight percent of cases so far this year are among black Tuaregs. This program has implemented integrated surveillance in formerly endemic areas since 1997.

**Burkina Faso** reported only 20 indigenous cases (and 6 imported cases, 3 from Ghana and 3 from Mali) in 13 villages in January-July 2004, compared to 114 indigenous cases in the same period of 2003, for a reduction of -82%. Transmission was contained in 18 (69%) of the 26 cases reported. This program is considering introducing cash rewards for reporting of cases next year.

**Cote d'Ivoire** reported 16 indigenous cases (and 1 case imported from Ghana) in 6 villages in January-July 2004, compared to 42 indigenous cases in the same period of 2003, for a reduction of -62%. Transmission was contained in 7 (41%) of the 17 cases reported. Seven of this year's cases were discovered in Tanda District on the same day, causing concern that there may be other cases not yet known. The program does have access to investigate rumors of cases on the rebel-held side of the country, but so far no confirmed cases have been seen there. *The Government of Cote d'Ivoire is to provide \$86,628 for the program in 2004.*

**Benin** has reported 3 indigenous cases (all contained) so far this year (2 in February, 1 in March), compared to 21 indigenous cases during the same seven months of 2003, for a reduction of -86%. All three cases in 2004 were detected in one village (Kokogberi) in Savalou District about one year after 3 cases occurred there in January 2003. This year's cases were detected and containment measures begun on the same day the worms began to emerge. The patients live in Benin, but farm in Togo near the endemic village of Telekope. *The Government of Benin has budgeted \$80,000 for the program this year, but it has not been released yet.*

**Mauritania** has reported 3 indigenous cases (all contained) in January-July 2004 (1 in January, 2 in June), 2 of them internally imported to 2 villages, the other in a village that was endemic in 2003. This is a reduction of -25%, from 4 cases this time last year. Both newly affected villages have safe sources of drinking water.

Table 1

**Program Review Meeting of Francophone Endemic Countries. Accra, Ghana, August 18-20, 2004  
Percentage Reductions During January - July 2003 and 2004 in Cases of Dracunculiasis From  
Endemic Villages Where the GWEPs Intervened**

| Country      | Number of endemic villages in | Number of Cases of dracunculiasis during |      |                  |      | Total number of cases during January |      | % Change during January - |
|--------------|-------------------------------|--|------|------------------|------|--------------------------------------|------|---------------------------|
|              |                               | Village Group I                          |      | Village Group II |      | 2003                                 | 2004 |                           |
|              |                               | 2003                                     | 2004 | 2003             | 2004 | 2003                                 | 2004 |                           |
| Niger        | 42                            | 16                                       | 25   | 30               | 0    | 46                                   | 25   | -46                       |
| Burkina Fa   | 45                            | 51                                       | 12   | 75               | 0    | 126                                  | 12   | -90                       |
| Togo         | 165                           | 317                                      | 99   | 171              | 0    | 488                                  | 99   | -80                       |
| Cote d'Ivoir | 15                            | 21                                       | 8    | 21               | 0    | 42                                   | 8    | -81                       |
| Mauritania   | 6                             | 1  | 1    | 4                | 0    | 5                                    | 1    | -80                       |
| Benin        | 12                            | 3  | 3    | 25               | 0    | 28                                   | 3    | -89                       |
| Mali         | 65                            | 30                                       | 8    | 80               | 0    | 110                                  | 8    | -93                       |
| Total        | 350                           | 439                                      | 156  | 406              | 0    | 845                                  | 156  | -82                       |
| % Change     |                               | -64                                      |      | -100             |      | -82                                  |      |                           |

Table 2

**Status of Key Indices of 2004\***

| Country       | # villages reporting 1+ cases | # villages reporting only 1 case | # cases reported in 2004* | % cases contained | Percentage of Endemic Villages     |                           |                   |                              |
|---------------|-------------------------------|----------------------------------|---------------------------|-------------------|------------------------------------|---------------------------|-------------------|------------------------------|
|               |                               |                                  |                           |                   | with filters in 100% of households | provided health education | where ABATE® used | with 1+ source of safe water |
| Ghana**       | 854                           |                                  | 5667                      | 61%               | 84%                                | 100%                      | 47%               | 45%                          |
| Mali          | 27                            | 22                               | 46                        | 78%               | 100%                               | 100%                      | 7%                | 7%                           |
| Togo          | 79                            | 50                               | 191                       | 64%               | 100%                               | 100%                      | 100%              | 54%                          |
| Niger         | 28                            | 18                               | 66                        | 79%               | 100%                               | 100%                      | 47%               | 0%                           |
| Burkina Faso  | 13                            | 10                               | 26                        | 67%               | 100%                               | 70%                       | 37%               | 70%                          |
| Cote d'Ivoire | 6                             | 3                                | 17                        | 38%               | 62%                                | 100%                      | 79%               | 93%                          |
| Benin         | 1                             | 0                                | 3                         | 100%              | 100%                               | 100%                      | 100%              | 100%                         |
| Mauritania    | 3                             | 3                                | 3                         | 100%              | 100%                               | 100%                      | 0%                | 100%                         |

\* provisional January - July

\*\* January - June

**ANNUAL REVIEW OF THE GUINEA WORM ERADICATION PROGRAMS (GWEPs) OF  
ENDEMIC FRANCOPHONE COUNTRIES  
ACCRA, GHANA, AUGUST 18-20, 2004**

GENERAL RECOMMENDATIONS

1. The ministries of health of the endemic countries, in collaboration with their partners, should implement a six-month follow-up of the level of implementation of the “Geneva Declaration on Dracunculiasis Eradication”.
2. The GWEPs should ensure the effective use, at all levels of the program, of the definitions and standards (revised) published in May 2003 in the WHO Weekly Epidemiological Record [Rapport Epidémiologique Hebdomadaire] (No. 37).
3. All the endemic countries reporting few cases of Guinea worm disease (GWD) should investigate, immediately and seriously, the history of each case, i.e., the travel history, including residences during travel, in order to determine the probable origin of the infection.
4. The GWEPs should report on the status of the recommendations set forth in the annual meeting of Program Managers held in Bamako, Mali (March 2004), and use these to formulate quantifiable goals to be reached in their 2005 action plan.
5. The GWEPs should check the efficacy of ABATE® larvicide treatments regularly; a protocol which could be used in this context is in the process of being developed by the WHO.
6. Each GWEP national coordinator should evaluate, at mid-year, the level of success in reaching its program’s annual goals.
7. Those villages receiving borehole wells in Togo, Niger, and Mali from the Gates Guinea Worm Contingency Fund through UNICEF, should be selected in collaboration with the national GWEP.
8. The UNICEF offices in Mali, Togo and Niger, in collaboration with the relevant departments of the governments in question, should do everything possible to ensure that the support provided by the Gates Guinea Worm Contingency Fund for provision of safe drinking water be implemented before the end of 2005.

9. The governments of the countries with endemic GWD, which have not yet allocated funds to their national GWEP, are requested to do so as of 2005, pursuant to the ‘Geneva Declaration on Dracunculiasis Eradication’.
10. The partners of the countries with endemic GWD should continue to support all GWEPs until the eradication of dracunculiasis has been certified.

#### SPECIFIC RECOMMENDATIONS:

##### MAURITANIA

Mauritania’s GWEP should:

1. reaffirm its commitment to stop the local spread of dracunculiasis in Mauritania in 2004;
2. implement a plan which ensures the immediate investigation and documentation of each case (suspected or real) of GWD; the results of these investigations should be shared, immediately, with partner organizations (WHO, UNICEF, The Carter Center / Global2000);
3. identify, at the regional or national level, a focal point (person), who can immediately confirm (reinvestigate), each new case of GWD (real or rumored case).

##### BENIN

The Benin GWEP should:

1. implement, in 2005, a national committee for the certification of the eradication of Guinea worm disease;
2. strengthen active surveillance in the Atacora Region.
3. implement a plan which ensures the immediate investigation and documentation of each case (suspected or real) of Guinea worm disease; the results of this investigation should be shared, immediately, with partner organizations (WHO, UNICEF, The Carter Center / Global2000);
4. identify, at the regional on national level, a focal point (person) to immediately confirm (reinvestigate), each new case of GWD (real or rumored case).

##### COTE D’IVOIRE

The Côte d’Ivoire National GWEP should:

1. intensify its epidemiological surveillance and investigation of cases of GWD in the endemic areas of Tanda and Bondoukou Districts;
2. the Department of Health, with the support of its partners, should increase its epidemiological surveillance in the zones which used to be endemic, in particular in the Northern, West Central and Western zones (*presently under the control of the Forces Nouvelles* [New Forces]);
3. renew the quarterly meetings with its partners, i.e., the Technical Committee, and invite the WHO /Côte d’Ivoire to play a more significant role.

## **BURKINA FASO**

The Ministry of Health, the WHO, and the other partners must ensure increased active epidemiological surveillance in areas free of GWD that are at risk.

## **MALI**

The Mali GWEP should:

1. train/re-train, on an annual basis, the Community Health Agents (CHA) [Agents de Santé Communautaires (ASC)] of those areas which are endemic;
2. intensify active surveillance and search for cases of GWD in the nomadic areas where GWD is endemic and in areas that are at risk.

UNICEF / Mali should use, before the end of 2005, the Gates Guinea Worm Contingency Funds allocated for the supply of drinking water exclusively for the endemic villages of the Gao, Ansongo and Gourma-Rharous Districts.

## **NIGER**

The Niger GWEP should:

1. intensify its active surveillance and search for cases of GWD in the nomadic and at risk areas.

UNICEF/Niger should use, exclusively and before the end of 2005, the Gates Guinea Worm Contingency Funds allocated for the supply of drinking water for the endemic villages of Tillabéri and Téra Districts.

## **TOGO**

1. UNICEF / Togo must use, before the end of 2005, the Gates Guinea Worm Contingency Funds allocated for the supply of safe sources of drinking water in the currently endemic villages.
2. The GWEP and UNICEF should include in the list of villages already selected to receive the benefit of Gates Funds, the 2 endemic villages in Ogoou District bordering the village of Kokogberi in Benin.
3. Within the scope of the implementation of the “Geneva Declaration on Dracunculiasis Eradication”, the Government of Togo is encouraged to include, as of 2005, on an annual basis, a budget item for financing activities of the GWEP.

## **GHANA HOLDS SEMI-ANNUAL PROGRAM REVIEW**

The National Coordinator, Dr. Andrew Seidu-Korkor, summarized the current status of Ghana’s GWEP by systematically reviewing where the GWEP stands in regard to each of its 2004 objectives at the semi-annual national review held in Accra on August 16-17. In January-July 2004, Ghana has reported 5,925 cases, vs. 5,942 cases in the same period of 2003, for a change of 0%. Northern Region’s cases have been reduced by –13% (4148 vs. 4465) and Brong-Ahafo’s by –44% (140 vs. 252), but Volta Region’s cases

are up by +90% (785 vs 1,495). After increases in January – April, Volta Regions cases were down by -37%, -28% and -79% in May, June and July, respectively. In Nkwanta District (outbreak reported in February 2003), which is the most affected area of the Volta Region and the highest endemic district in the country, cases have been reduced by -44%, -30%, and -82% in May, June and July 2004. In Savelugu-Nanton District (outbreak reported in April 2003), which is the third highest endemic district in the country, cases have been reduced by -23% and -68% in June and July 2004. Reductions are not yet manifest in Tolon-Kumbungu District, where an outbreak was reported in June 2003. Kete Krachi District reported a decrease in cases of -83% in July. Overall, case containment has remained about the same so far in 2004, 61%, vs. 59% in 2003. The case containment rate is 70% in Northern Region, 32% in Volta Region, and 96% in Brong-Ahafo Region. The status of dracunculiasis in the top 20 endemic districts during January – July 2003 and 2004 is shown in figure 1.

Of the 278 borehole wells planned under the government's HIPC-funded initiative, 189 have been drilled, of which 96 were successful (55 in NR, 11 in BAR, 30 in VR), but none of the successful boreholes in NR and BAR had been fitted with hand pumps as of this meeting. The 55 successful boreholes in NR will reach villages with 139 cases, while the 24 successful wells now providing safe drinking water in Nkwanta District will reach villages that have reported 353 cases. UNICEF, Church of Christ, and several other NGOs are also drilling wells in endemic villages.

Dr. George Amofa, Director of the Public Health Division of Ghana Health Service, opened the meeting. The resident representatives of WHO and UNICEF and a representative of The Carter Center spoke at the brief opening ceremony. In an address read on his behalf, *the Minister of Health announced that he had just allocated 1.7 billion cedis (\$188,888) for ensuring active surveillance in recently freed villages of the country.* The Deputy Minister of Works and Housing, which includes the Community Water and Sanitation Agency, and the Deputy Director of Ghana Health Services also participated on the first day of the meeting. The newly appointed Regional Director of Health Services for Volta Region and a representative of JICA from the Japanese embassy participated in both days of the review.

## **GHANA GUINEA WORM ERADICATION PROGRAMME MID-YEAR REVIEW FOR REGIONAL COORDINATORS AUGUST 16-17, 2004, GNAT HALL, ACCRA DRAFT RECOMMENDATIONS**

### **COMMUNITY BASED SURVEILLANCE**

1. The Ghana Health Service (GHS) should implement the Community-Based Surveillance (CBS) system nationwide, immediately. Further, it should fully ensure the incorporation of CBS into the Integrated Disease Surveillance and Response (IDSR) umbrella.
2. The GHS should revise the CBS register to conform with current reporting formats and reflect prevailing communicable diseases and other vital events exclusive to other regions and identifiable by village volunteers.

### **GUINEA WORM ERADICATION PROGRAM (GWEP) SURVEILLANCE**

3. The GWEP should improve surveillance through:
  - Wide diffusion and use of the appropriate forms for case investigation and reporting of imported cases.
  - Investigating thoroughly cases to confirm and establish the origin.
  - Using the international definitions to report on GWD.

4. The GWEP should pay special attention in low endemic areas and use appropriate forms (imported case forms, rumor registers, case investigation forms) to document and keep records on surveillance activities.

### **MONITORING AND SUPERVISION**

5. Supervisors should use the standard check-list (including feedback) weekly to monitor all interventions put in place, and resolve all issues in the endemic village.

### **INTERVENTIONS**

6. The Ministers of Health and Works and Housing should monitor the status of water supply provision in endemic villages monthly.
7. The GWEP should report monthly to Minister of Health on the status of provision of safe drinking in endemic villages
8. District Assemblies should encourage rural water programs to ensure regular and prompt maintenance of boreholes.
9. UNICEF/Partners should advise on alternative technologies for utilizing surface water in areas where drilling of boreholes is not feasible.
10. Sections of large endemic villages (5000+) that use pond water should be provided with filters.

### **OWNERSHIP AND MANAGMENT**

11. District Directors of Health Services should participate in national and regional meetings on GWD.
12. Regional and District Health Medical Teams (RHMT and DHMTs) must play a central role in planning and implementation of GW activities. District GWEP teams should brief DHMTs on progress, needs, and plans each month.

### **PARTNERSHIP AND COLLABORATION**

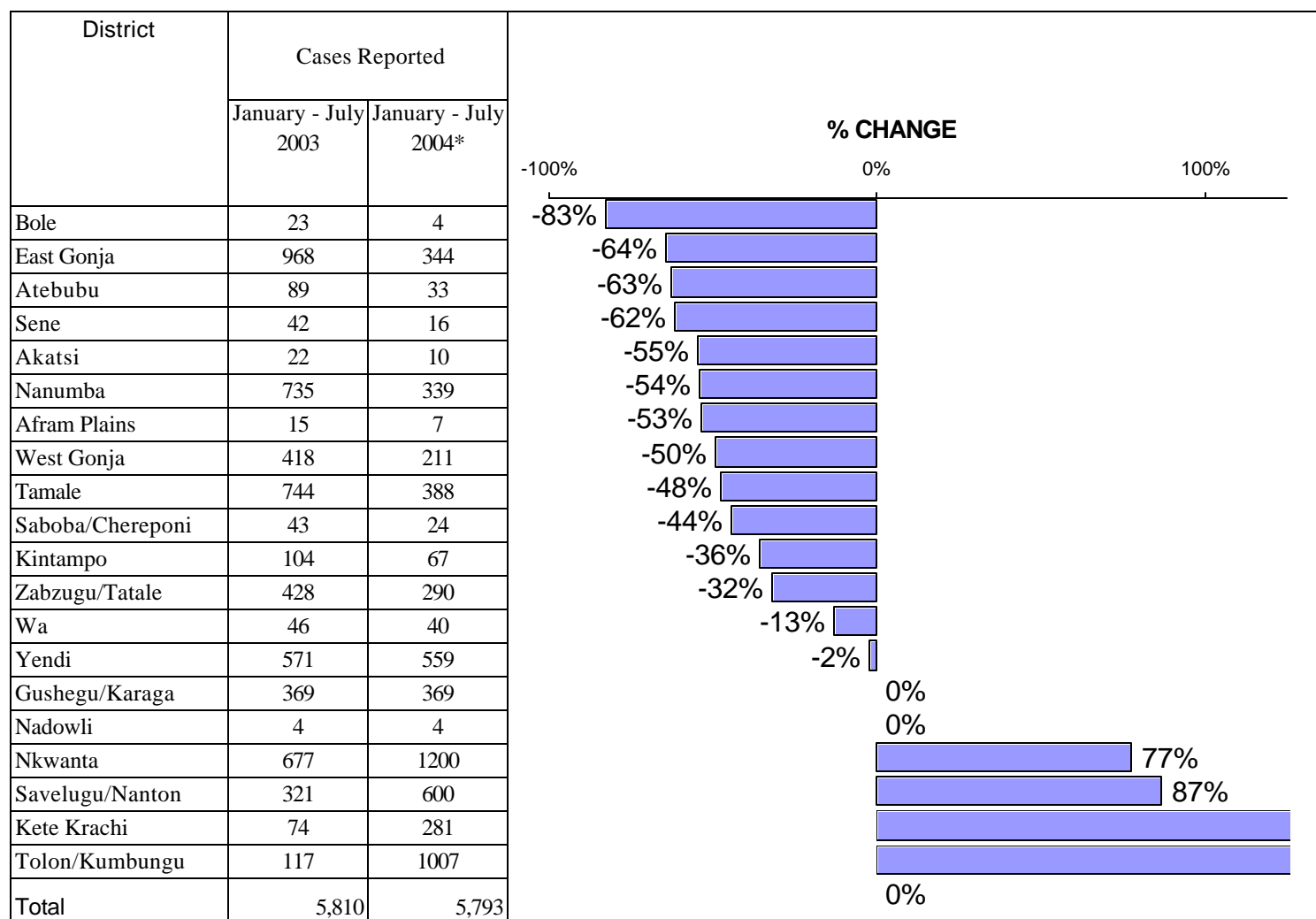
13. GGWEP should consider collaborating with other relevant sectors, such as Agricultural, Education, Local Government, (Environmental Health, District Assemblies), etc.
14. The Ghana Red Cross Society (GRCS) mother's clubs should be recognized as community volunteers and included in trainings, monthly meetings and other motivational activities.
15. Monthly meetings of the Intersectorial Coordinating Committee (ICC) should be held at regional and district levels to facilitate dialogue between water development partners and relieve communication discrepancies on water development issues.

Figure 1

**GHANA GUINEA WORM ERADICATION PROGRAM**

Status of Top 20 Endemic Districts in 2003

Number of Cases Reported During January - July 2003 and 2004\*, Percent Change in Cases Reported



\* Provisional



Table 2

Number of cases contained and number reported by month during 2004\*

(Countries arranged in descending order of cases in 2003)

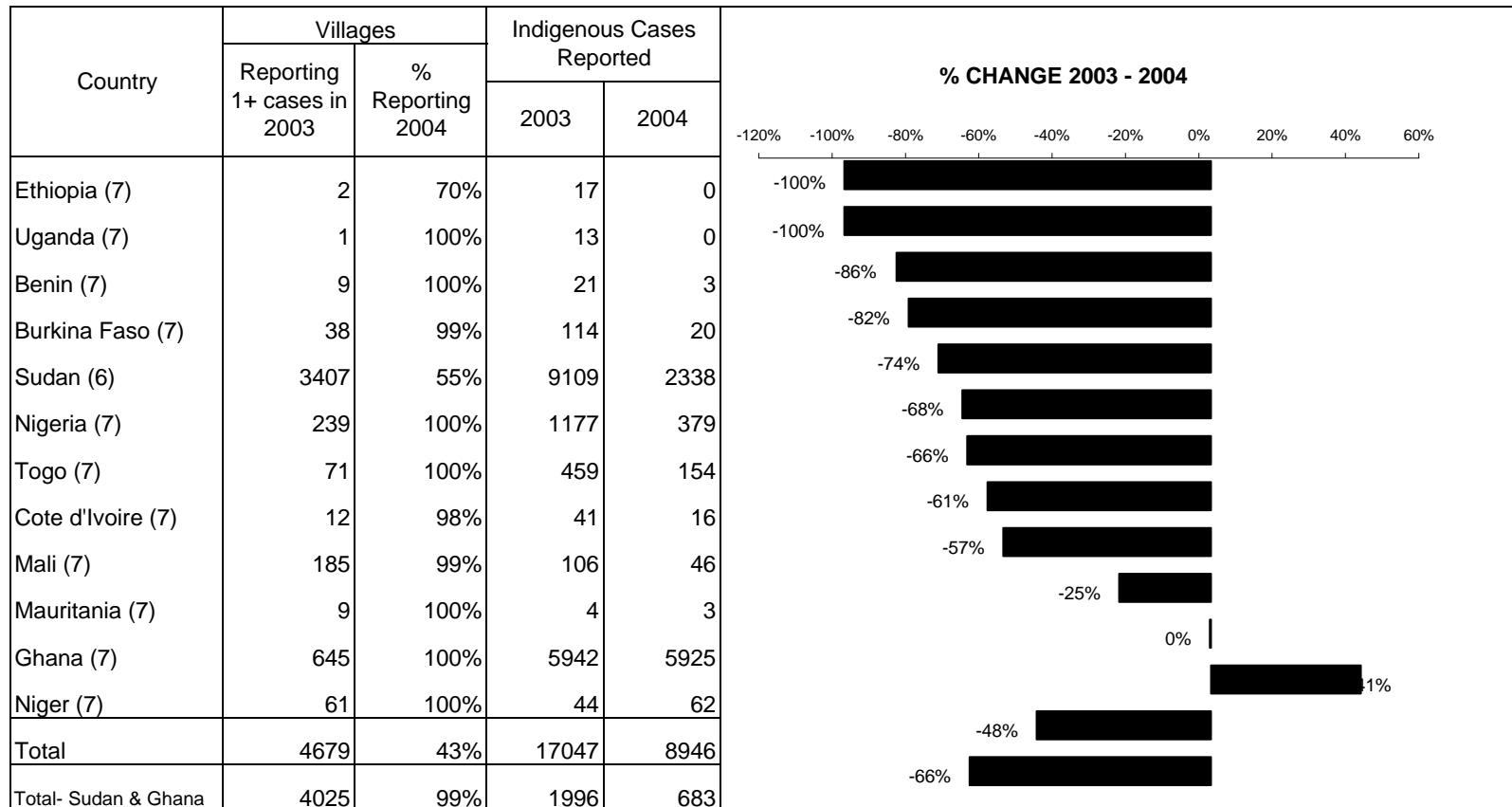
| COUNTRIES REPORTING CASES | NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED |            |            |            |            |            |           |        |           |         |          |          |             | CONT. | % |
|---------------------------|--|------------|------------|------------|------------|------------|-----------|--------|-----------|---------|----------|----------|-------------|-------|---|
|                           | JANUARY  | FEBRUARY   | MARCH      | APRIL      | MAY        | JUNE       | JULY      | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER | TOTAL*      |       |   |
| SUDAN                     | 33 / 193   | 46 / 220   | 31 / 163   | 52 / 415   | 124 / 779  | 131 / 568  | /         | /      | /         | /       | /        | /        | 417 / 2338  | 18    |   |
| GHANA                     | 647 / 1214   | 668 / 1139 | 625 / 981  | 593 / 906  | 671 / 906  | 281 / 521  | 134 / 258 | /      | /         | /       | /        | /        | 3619 / 5925 | 61    |   |
| NIGERIA                   | 81 / 101   | 64 / 73    | 40 / 48    | 25 / 31    | 63 / 69    | 31 / 35    | 17 / 22   | /      | /         | /       | /        | /        | 321 / 379   | 85    |   |
| MALI                      | 1 / 1  | 0 / 1      | 0 / 1      | 0 / 0      | 5 / 5      | 9 / 12     | 22 / 27   | /      | /         | /       | /        | /        | 37 / 47     | 79    |   |
| TOGO                      | 35 / 46  | 20 / 29    | 18 / 47    | 12 / 21    | 17 / 20    | 16 / 22    | 4 / 6     | /      | /         | /       | /        | /        | 122 / 191   | 64    |   |
| NIGER                     | 1 / 1  | 2 / 2      | 1 / 1      | 3 / 4      | 4 / 9      | 13 / 16    | 28 / 33   | /      | /         | /       | /        | /        | 52 / 66     | 79    |   |
| BURKINA FASO              | 1 / 1  | 1 / 2      | 0 / 0      | 2 / 2      | 5 / 5      | 2 / 3      | 7 / 13    | /      | /         | /       | /        | /        | 18 / 26     | 69    |   |
| COTE D'IVOIRE             | 1 / 2  | 5 / 5      | 0 / 5      | 1 / 4      | 0 / 1      | 0 / 0      | 0 / 0     | /      | /         | /       | /        | /        | 7 / 17      | 41    |   |
| BENIN                     | 0 / 0  | 2 / 2      | 1 / 1      | 0 / 0      | 0 / 0      | 0 / 0      | 0 / 0     | /      | /         | /       | /        | /        | 3 / 3       | 100   |   |
| ETHIOPIA                  | 0 / 0  | 1 / 1      | 0 / 0      | 2 / 2      | 4 / 4      | 3 / 4      | 2 / 2     | /      | /         | /       | /        | /        | 12 / 13     | 92    |   |
| UGANDA                    | 0 / 0  | 0 / 0      | 0 / 0      | 0 / 0      | 1 / 1      | 0 / 0      | 0 / 0     | /      | /         | /       | /        | /        | 1 / 1       | 0     |   |
| MAURITANIA                | 1 / 1  | 0 / 0      | 0 / 0      | 0 / 0      | 0 / 0      | 2 / 2      | 0 / 0     | /      | /         | /       | /        | /        | 3 / 3       | 100   |   |
| TOTAL*                    | 801 / 1560   | 809 / 1474 | 716 / 1247 | 690 / 1385 | 894 / 1799 | 488 / 1183 | 214 / 361 | 0 / 0  | 0 / 0     | 0 / 0   | 0 / 0    | 0 / 0    | 4612 / 9009 | 51    |   |
| % CONTAINED               | 51   | 55         | 57         | 50         | 50         | 41         | 59        |        |           |         |          |          | 51          |       |   |

\* PROVISIONAL

Shaded cells denote months when zero indigenous cases were reported. Numbers indicate how many imported cases were reported and contained that month.

Figure 2

Number of Villages/Localities Reporting Cases of Dracunculiasis in 2003, Percentage of Endemic Villages Reporting in 2004\*, Number of Indigenous Cases Reported During the Specified Period in 2003 and 2004\*, and Percent Change in Cases Reported



(7) Indicates month for which reports were received, e.g., Jan. - July 2004

\* Provisional

Figure 3

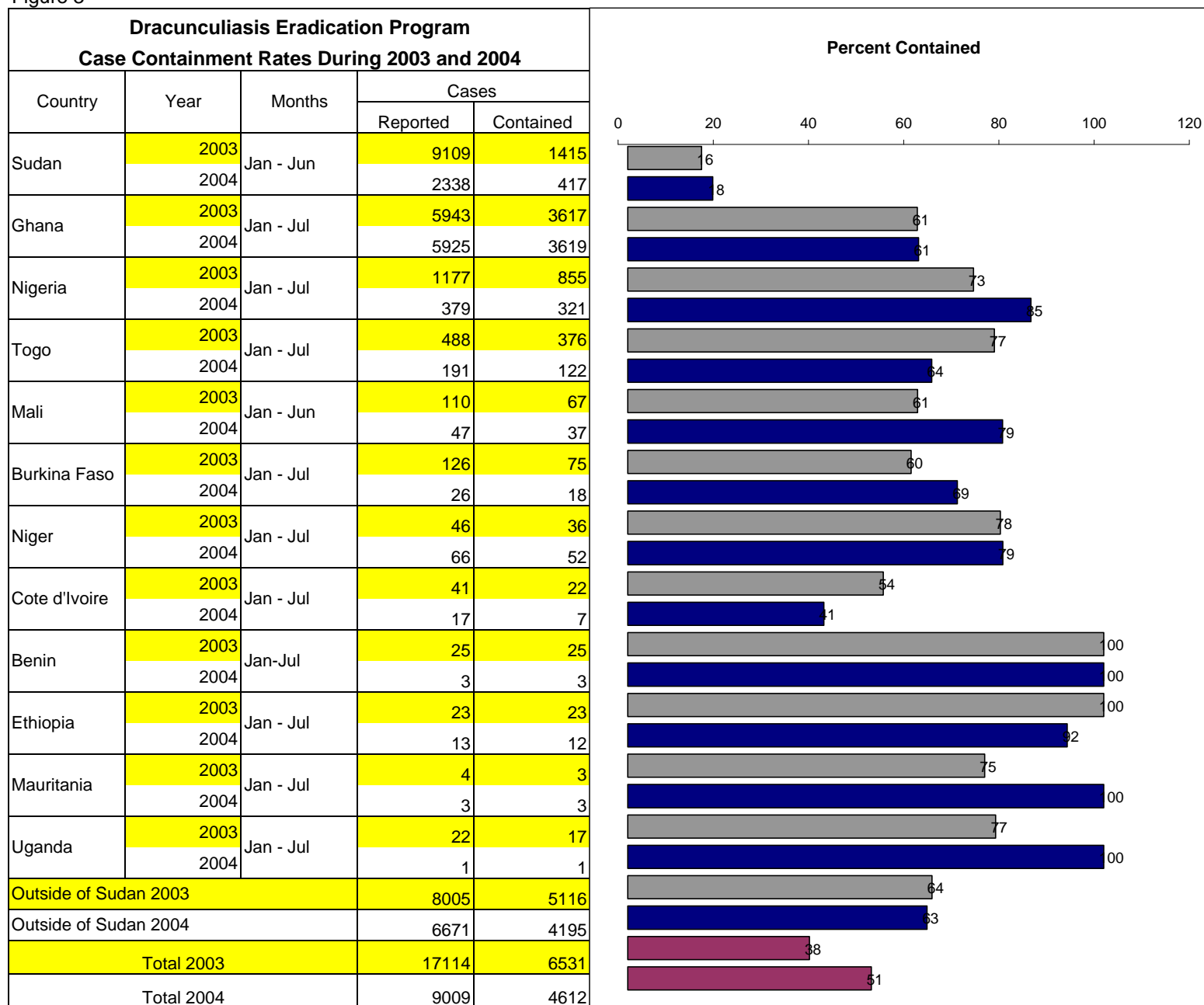
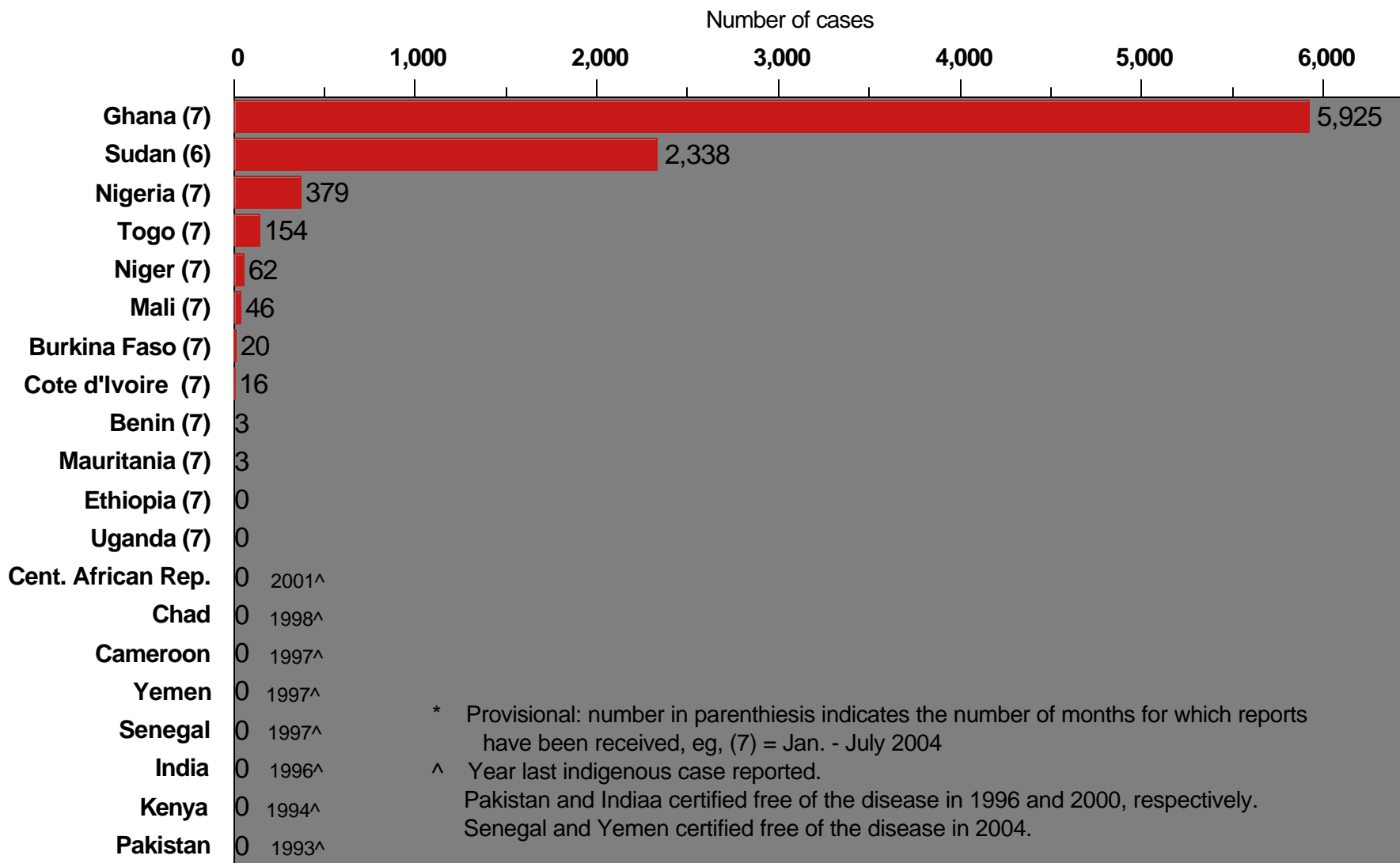


Figure 4

# Distribution by Country of 8,946 Indigenous Cases of Dracunculiasis Reported during 2004\*

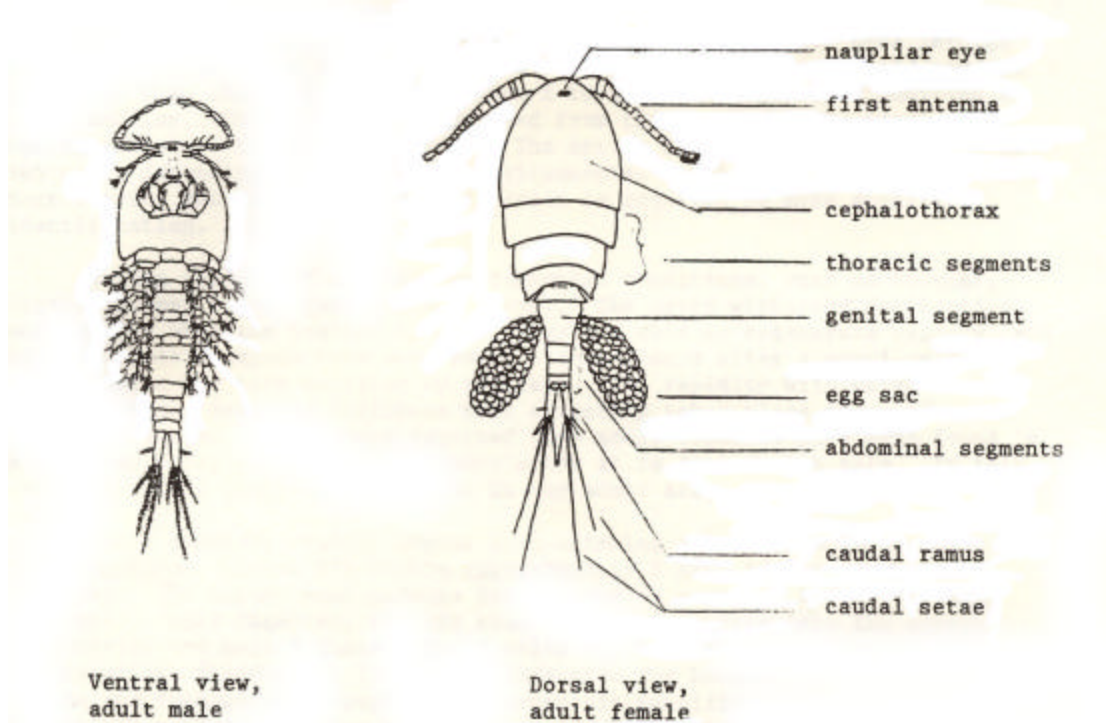


**PROCEDURE SUGGESTED BY THE WORLD HEALTH ORGANISATION AND THE CARTER CENTER FOR ASSESSING THE EFFECT OF ABATE® LARVICIDE ON CYCLOPOID COPEPODS, THE INTERMEDIATE HOST OF GUINEA WORM**

**Background**

Cyclopoid copepods belong to the phylum Arthropoda, class Crustacea, subclass Copepoda, order Cyclopoida, family Cyclopoida. Copepods are important constituents of plankton and food chains in bodies of fresh water. Their preferred habitats are transient or permanent stagnant sources of fresh water, such as pools, ponds, and open wells.

Female copepods lay eggs (see figure below). As immature copepods grow in size to reach adulthood, they must shed their carapace (molt) each time. Adult females range in size from 1-3 millimeters, depending on the species. Males are smaller. Adult copepods will usually be a small proportion of all the copepod stages found in stagnant sources of water, i.e., most would be immature. Importantly, stagnant sources of fresh water not only support thriving populations of copepods, but also support myriads of other small fresh water organisms e.g., ostracods, and together these form part of the fresh water plankton.



To accurately estimate the density of cyclopoid copepods in samples of water from a stagnant source would require systematic sieving of water with plankton nets, and separating the cyclopoid forms (immature and adult stages) from the myriads of other organisms found in such samples. This is usually done with the aid of a dissecting microscope and requires someone knowledgeable in the identification of these organisms, time, and lots of patience.

The sampling procedure outlined below provides a practical means of quickly assessing the impact of ABATE® on all of the animal plankton (cyclopoid, copepods, ostracods, etc.) in stagnant sources of water. Ideally, this sampling procedure should be done before the application of ABATE® larvicide and repeated 48-72 hours after treatment. However, if the GWEP is only doing spot-check evaluations of the proper use of ABATE® larvicide, only conduct the procedure below once, i.e., 48-72 hours after treatment.

### **Assessing the density of cyclopoid copepods before treatment with ABATE® Larvicide**

1. Only trained Guinea Worm Eradication Program (GWEP) personnel appointed to perform this activity should carry out this test. These personnel should be independent of those charged with treating sources of drinking water with ABATE® larvicide.
2. Sampling of water should be preferably done when the cyclopoid copepods move to the surface (morning or evening).
3. 25 liters of water should be sampled. Five samples of water, each containing a volume of 5 liters should be collected, 4 from around the edges of the pond (but not scraping the bottom), e.g., 2 samples from one side and 2 from the opposite side of the pond, and if possible one sample from the around the center of the pond. The container used to collect the sample should be allowed to sink to the bottom and then pulled up out of the water.
4. The container used can be a plastic or metal bucket open at the top and hanged with a rope connected to the handle or to four points on the top edge of the bucket. Do not use small mouth containers.
5. Each of the five-liter samples (25 liters total) should be filtered using a standard nylon filter (100 micron mesh).
6. After filtering the 25-litre sample, the material filtered should be carefully back-washed (using clean water from a borehole well or bottled water) into transparent glass (0.5 liter capacity is suggested).
7. Examine the glass by raising it to a light source (e.g. sunlight) and estimate the density of organisms swimming around. Grade the density of swimming organisms on a scale of 0-10. A grade of 10 would indicate a density such that there is hardly any room for organisms to move around, a grade of 5 would indicate that about half of the column of water is free of organisms, and a grade of 0 indicates zero organisms swimming around. It is very important to use the same size transparent glass each time to view the swimming organisms and to estimate their density. Use a hand-held magnifying lens to check for cyclopoid copepods to get a sense of their relative numbers. Cyclopoid copepods move in zigzag pattern (e.g., these dart around), are pear shaped, usually have a single red eye, are white in color, and are about 1 to 3 mm in size. One may see adult females with egg pouches on its side (see above figure).

### **Assessing the density of cyclopoid copepods after treatment with ABATE® Larvicide**

Assessment of the effect of the ABATE® larvicide application should be done between 48 to 72 hours after treatment. Steps 1 to 7 (see above) should be repeated. The density of cyclopoid copepods after treatment should be again estimated. Ideally, after the application with ABATE® larvicide the number of cyclopoid copepods in 25 liters of sampled water should be zero. However, zero counts will seldom be the obtained, as some of the immature stages of cyclopoid copepods survive the treatment with ABATE® larvicide. Although the immature stages found 48-72 hours after treatment will be too small to ingest larvae of Guinea worm, in time (about 4 weeks) these will grow into the adult stages. That is why treatment of stagnant sources of drinking water with ABATE® larvicide must be repeated at 4 week intervals throughout the transmission season. A reduction of 80-90% in the density of swimming organisms, compared to the estimated density before treatment, indicates that the application of ABATE® larvicide was appropriate and successful. Using the magnifying lens, check again to see how many cyclopoid copepods there are. If the ABATE® larvicide treatment has been successful, the relative number of copepods should be greatly reduced and these should be smaller in size than before treatment.

## NO INDIGENOUS CASES OF DRACUNCULIASIS IN UGANDA DURING LAST 12 MONTHS



**Uganda** has now been 12 months without an indigenous case of dracunculiasis, and has officially entered the pre-certification stage of its program. CONGRATULATIONS, Uganda!!!

### IN BRIEF:

#### MR. ARYC MOSHER REPLACES MRS. NWANDO DIALLO AS THE CARTER CENTER RESIDENT TECHNICAL ADVISOR IN GHANA

On July 28, 2004 Mr. Aryc Mosher officially assumed responsibility as The Carter Center's Resident Technical Advisor (RTA) to Ghana's Guinea Worm Eradication Program. Welcome, Aryc! Mrs. Nwando Diallo served as RTA from July 2002- August 2004 and assisted the GWEP to implement and intensify a broad range of interventions against Guinea worm disease in Ghana. She collaborated closely and effectively with all of Ghana's GWEP partners and was an excellent steward of program assets and resources. Thank you Nwando!

#### KINGDOM OF SAUDI ARABIA DONATION



The Carter Center has received a pledge of \$1 million over five years from The Kingdom of Saudi Arabia for support of the campaign to eradicate Guinea worm disease. This contribution will be used to support the Center's efforts to make the final push to eradicate Guinea worm disease in the remaining endemic countries. The Kingdom of Saudi Arabia has been a committed partner of The Carter Center since 1984, contributing \$1.5 million to the construction of the Center. Since then, the Kingdom of Saudi Arabia has provided nearly \$8 million to make Guinea worm eradication a reality.

#### **The schedule for Program Reviews is as follows:**

Sudan: October 5-6 in Nairobi

Nigeria: October 11-12 in Jos

Ethiopia and Uganda: November 16-18 in Kampala

#### **RECENT PUBLICATIONS**

World Health Organization. 2004. Dracunculiasis eradication. Weekly Epidemiological Record. 79(25):234-235.

Cook GC. 2004. Discovery and clinical importance of the filariases. Infectious Disease Clinics of North America. 18(2):219-30.

Greenaway C. 2004 Dracunculiasis (Guinea worm disease). Canadian Medical Association Journal. Vol. 170(4)(pp 495-500.

Molyneux DH. Hopkins DR. Zagaria N. 2004. Disease eradication, elimination and control: The need for accurate and consistent usage. Trends in Parasitology. Vol. 20(8)(pp 347-351).



ANDY AGLE (1937-2004)

The world of Guinea worm eradication lost one of its most important warriors with the unfortunate passing of Mr. Andrew Nils Agle in his sleep in Lagos, Nigeria on August 13, 2004. We deeply regret having to share this news. Andy had a stellar career in international health as a public health advisor at CDC, including work in the Smallpox Eradication Programs of Togo, Dahomey (Benin), Afghanistan, and Bangladesh before he served as Director of Operations for Global 2000 at The Carter Center for nine years, ending in 1999. At The Carter Center, he played a pivotal role in helping to initiate and support Guinea Worm Eradication Programs in francophone West Africa especially. The Government of Mali named him a Chevalier of the National Order of Mali in 1998. In a statement to Andy's family and friends, former President Jimmy Carter said, "Andy was a vital member of our Carter Center family", and "it was our great fortune to have him as a leader of our efforts in agriculture, Guinea worm eradication, and river blindness control". Persons who wish to do so may contact his family at: The Family of Mr. Andy Agle, 220 Northland Trail, Atlanta, GA 30342, USA; email: ddcidelman@mosaiceducation.com . Contributions may be earmarked for the Endowment for Global Health Priorities in memory of Andy Agle and sent to: The CDC Foundation, 50 Hurt Plaza, Suite 765, Atlanta, GA 30303, USA.

*Inclusion of information in the Guinea Worm Wrap-Up does not  
constitute "publication" of that information.  
In memory of BOB KAISER.*

*For information about the GW Wrap-Up, contact Dr. James H. Maguire, Director, WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis, NCID, Centers for Disease Control and Prevention, F-22, 4770 Buford Highway, NE, Atlanta, GA 30341-3724, U.S.A. FAX: 770-488-7761. The GW Wrap-Up web location is <http://www.cdc.gov/ncidod/dpd/parasites/guineaworm/default.htm>.*



CDC is the WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis.