



Date: March 20, 2009



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

Subject: GUINEA WORM WRAP-UP #188

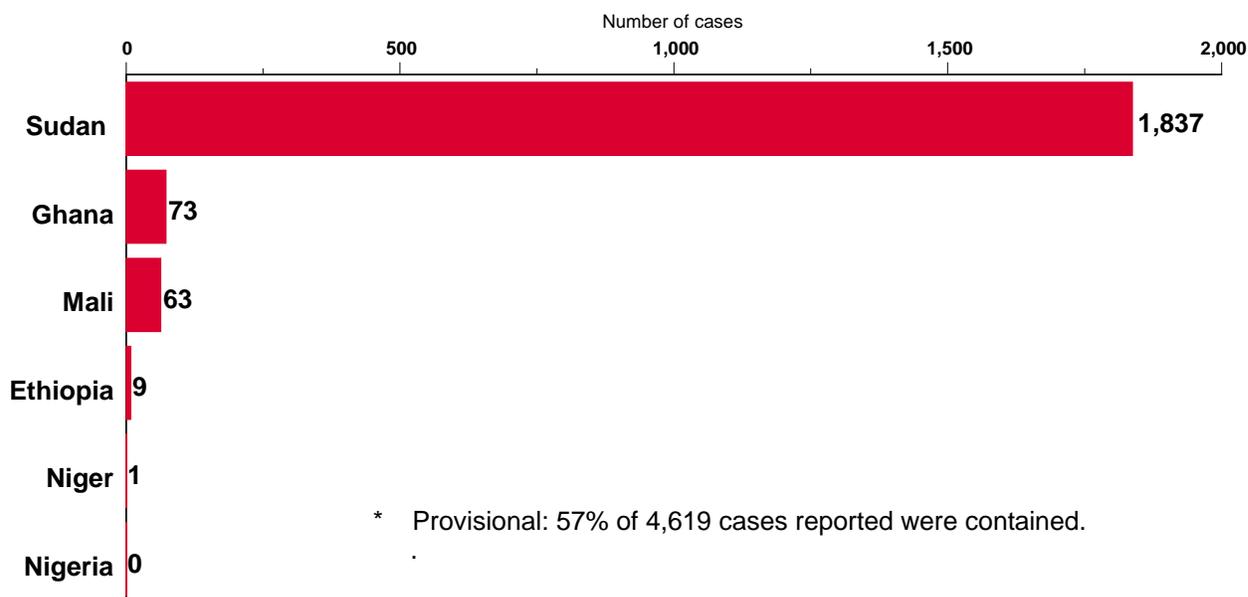
To: Addressees

**TIME FOR THE “A” TEAMS: ANALYSIS (COMPLETE), ANTICIPATION (FOCUSED), AND ACTION (RAPID) in 2009**

As we reminded all concerned in our January issue (*Guinea Worm Wrap-Up #186*), 2009 is the target year that was agreed in 2004 in which we are seeking to stop all transmission of Guinea worm disease (dracunculiasis). In that spirit we offer a critical summary of eradication activities in each of the six remaining endemic countries, based on the reports presented to the annual meeting of program managers of those programs that was held in Bamako, Mali on March 4-6. Guinea Worm Eradication Programs (GWEPs) reduced cases by 62% during 2006-2007 (from 25,217 to 9,585, a difference of 15,632 cases), and by 52% during 2007-2008 (from 9,585 to 4,619, a difference of 4,966 cases). The objective now is to stop transmission from all cases of Guinea worm disease (GWD) in 2009 so that zero cases are reported during 2010. The number of uncontained cases reported by country during 2008 is shown in figure 1. Most programs reviewed their activities in 2008 satisfactorily, but should now focus more on enhancing vigilance and interventions in 2009. **Each of the six national Guinea Worm Eradication Programs needs to analyze its epidemiological data for 2008 and 2009, use the results of that analysis to anticipate where to focus surveillance and preventive measures in 2009, and act rapidly in 2009.**

Figure 1

**Distribution by Country of 1,983 Uncontained Cases of Dracunculiasis in 2008\***



\* Provisional: 57% of 4,619 cases reported were contained.

Table 1

Number of Cases Contained and Number Reported by Month during 2008\*  
(Countries arranged in descending order of cases in 2007)

| COUNTRIES REPORTING CASES | NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED |          |          |           |           |           |           |           |           |           |          |          | TOTAL*      |
|---------------------------|------------------------------------------------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-------------|
|                           | JANUARY                                              | FEBRUARY | MARCH    | APRIL     | MAY       | JUNE      | JULY      | AUGUST    | SEPTEMBER | OCTOBER   | NOVEMBER | DECEMBER |             |
| SUDAN                     | 8 / 32                                               | 13 / 34  | 39 / 88  | 112 / 258 | 259 / 618 | 394 / 759 | 399 / 783 | 313 / 536 | 126 / 254 | 94 / 160  | 16 / 75  | 8 / 21   | 1781 / 3618 |
| GHANA                     | 66 / 73                                              | 62 / 80  | 38 / 48  | 61 / 68   | 70 / 74   | 57 / 73   | 26 / 30   | 12 / 13   | 4 / 5     | 8 / 8     | 12 / 14  | 12 / 15  | 428 / 501   |
| MALI                      | 1 / 1                                                | 0 / 0    | 0 / 0    | 1 / 1     | 16 / 16   | 59 / 60   | 111 / 120 | 50 / 60   | 48 / 72   | 44 / 56   | 20 / 27  | 4 / 4    | 354 / 417   |
| NIGERIA                   | 28 / 28                                              | 8 / 8    | 1 / 1    | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 1 / 1    | 0 / 0    | 38 / 38     |
| NIGER                     | 0 / 0                                                | 1 / 1    | 0 / 0    | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 1 / 1     | 0 / 0     | 0 / 0    | 0 / 0    | 2 / 3       |
| ETHIOPIA**                | 0 / 0                                                | 0 / 0    | 6 / 10   | 21 / 23   | 2 / 2     | 2 / 3     | 0 / 0     | 0 / 2     | 0 / 0     | 1 / 1     | 0 / 0    | 0 / 0    | 32 / 41     |
| BURKINA FASO              | 0 / 0                                                | 0 / 0    | 0 / 0    | 1 / 1     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0     | 0 / 0    | 0 / 0    | 1 / 1       |
| TOTAL*                    | 103 / 134                                            | 84 / 123 | 84 / 147 | 196 / 351 | 347 / 710 | 512 / 895 | 536 / 933 | 375 / 611 | 179 / 332 | 147 / 226 | 49 / 117 | 24 / 40  | 2636 / 4619 |
| % CONTAINED               | 77                                                   | 68       | 57       | 56        | 49        | 57        | 57        | 61        | 54        | 65        | 42       | 60       | 57          |
| % CONT. OUTSIDE SUDAN     | 93                                                   | 80       | 76       | 90        | 96        | 87        | 91        | 83        | 68        | 80        | 79       | 84       | 85          |

\* provisional

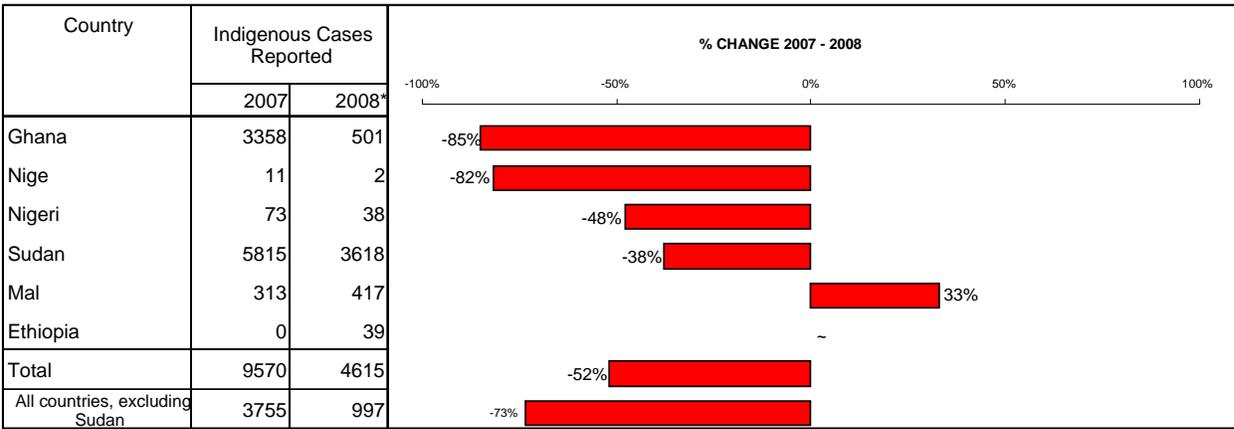
\*\* Although the source of the infection of 38/41 cases reported by Ethiopia has not been established beyond all doubt so far, available evidence suggests local transmission of GWD leading to these cases was likely during 2007. Moreover, one undisputed indigenous case was reported in October 2008 in the same area of Gambella Region. Two other cases were imported from Southern Sudan. Shaded cells denote months when zero indigenous cases were reported. Numbers indicate how many imported cases were reported and contained that month.

Table 2  
 Number of Cases Contained and Number Reported by Month during 2009\*  
 (Countries arranged in descending order of cases in 2008)

| COUNTRIES REPORTING CASES | NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED |          |       |       |       |       |       |        |           |         |          |          |          |
|---------------------------|------------------------------------------------------|----------|-------|-------|-------|-------|-------|--------|-----------|---------|----------|----------|----------|
|                           | JANUARY                                              | FEBRUARY | MARCH | APRIL | MAY   | JUNE  | JULY  | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER | TOTAL*   |
| SUDAN                     | 2 / 11                                               | /        | /     | /     | /     | /     | /     | /      | /         | /       | /        | /        | 2 / 11   |
| GHANA                     | 31 / 45                                              | 49 / 50  | /     | /     | /     | /     | /     | /      | /         | /       | /        | /        | 80 / 95  |
| MALI                      | 0 / 0                                                | 0 / 0    | /     | /     | /     | /     | /     | /      | /         | /       | /        | /        | 0 / 0    |
| ETHIOPIA**                | 0 / 0                                                | 0 / 0    | /     | /     | /     | /     | /     | /      | /         | /       | /        | /        | 0 / 0    |
| NIGERIA                   | 0 / 0                                                | 0 / 0    | /     | /     | /     | /     | /     | /      | /         | /       | /        | /        | 0 / 0    |
| NIGER                     | 0 / 0                                                | 0 / 0    | /     | /     | /     | /     | /     | /      | /         | /       | /        | /        | 0 / 0    |
| TOTAL*                    | 33 / 56                                              | 49 / 50  | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0  | 0 / 0     | 0 / 0   | 0 / 0    | 0 / 0    | 82 / 106 |
| % CONTAINED               | 59                                                   | 98       |       |       |       |       |       |        |           |         |          |          | 77       |
| % CONT. OUTSIDE SUDAN     | 69                                                   | 98       |       |       |       |       |       |        |           |         |          |          | 84       |

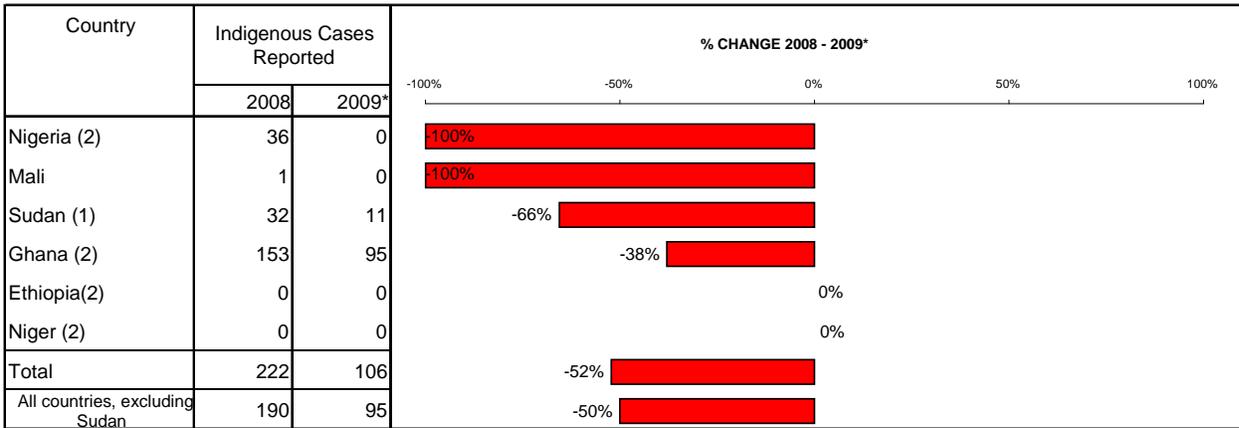
\* provisional  
 Shaded cells denote months when zero indigenous cases were reported. Numbers indicate how many imported cases were reported and contained that month.

**Figure 2**  
**Number of Indigenous Cases Reported During the Specified Period in 2007 and 2008\*, and Percent Change in Cases Reported**



\* Provisional: excludes 4 cases exported from one country to another

**Figure 3**  
**Number of Indigenous Cases Reported During the Specified Period in 2008 and 2009\*, and Percent Change in Cases Reported**



\* Provisional: excludes cases exported from one country to another

(2) Indicates months for which reports were received, i.e., Jan. - Feb. 2009

**Months since last indigenous case of dracunculiasis:**  
**Ethiopia:** 4 months, **Niger:** 4 months, **Nigeria:** 3 months, **Mali:** 2 months

**NIGERIA**

Nigeria reported 38 cases during 2008, all reportedly contained (Table 1), from 5 villages in 4 Local Government Areas, although all of the cases are believed to have originated in one village: Ezza Nkwubor. The Nigerian Guinea Worm Eradication Program (NIGEP) has reported zero cases in Jan-Feb 2009, vs. 36 cases in Jan-Feb 2008 (Figure 2). Fourteen months have now elapsed since the last two uncontained cases of GWD were recorded in December 2007 (Figure 3). Since May 2006, NIGEP has disseminated information via local FM and short wave national radio, posters, handouts, and person to person (mostly GWEP staff) about rewards for reporting of suspect cases that meet the definition of a case of GWD. NIGEP has also utilized national and local days for immunizations and Worm Weeks as opportunities to ask about cases of GWD. Moreover, NIGEP monitors the status of GWD monthly in 707 formerly endemic and high risk villages in 88 Local Government Areas in 17 states. During 2009 the monthly reporting rate in these 707 villages was 75%. The Nigerian program also investigated 526 rumors in 2008, versus 170 in 2007 and 176 in 2006 (Figure 4). The South-East Zone of the program, home of Ezza Nkwubor and other villages reporting cases in 2008, investigated 236 (45%) of the 526 rumors of cases of GWD. The proportion of 526 alleged cases reported via these modalities is shown in Figure 5, and the conditions identified during the alleged case investigations are listed in Table 4. The program offers a reward of 5,000 Naira (~US\$38) for reporting of a case, and it established a National Certification Committee on Guinea Worm Disease Eradication in 2005. *Other GWEPs should consider adopting modalities for surveillance employed by NIGEP, including ways for disseminating information about rewards as an engine for generating rumors of alleged cases, and the national Rumor Registry format (Table 3). Programs should also consider adapting modality to determine what proportion of people know about the cash reward and what to do if they learn of a suspected case.*

Figure 3

**Nigeria Guinea Worm Eradication Program**

**Monthly Uncontained Cases of Guinea Worm Disease in 2007 and Cases Reported During 2008**

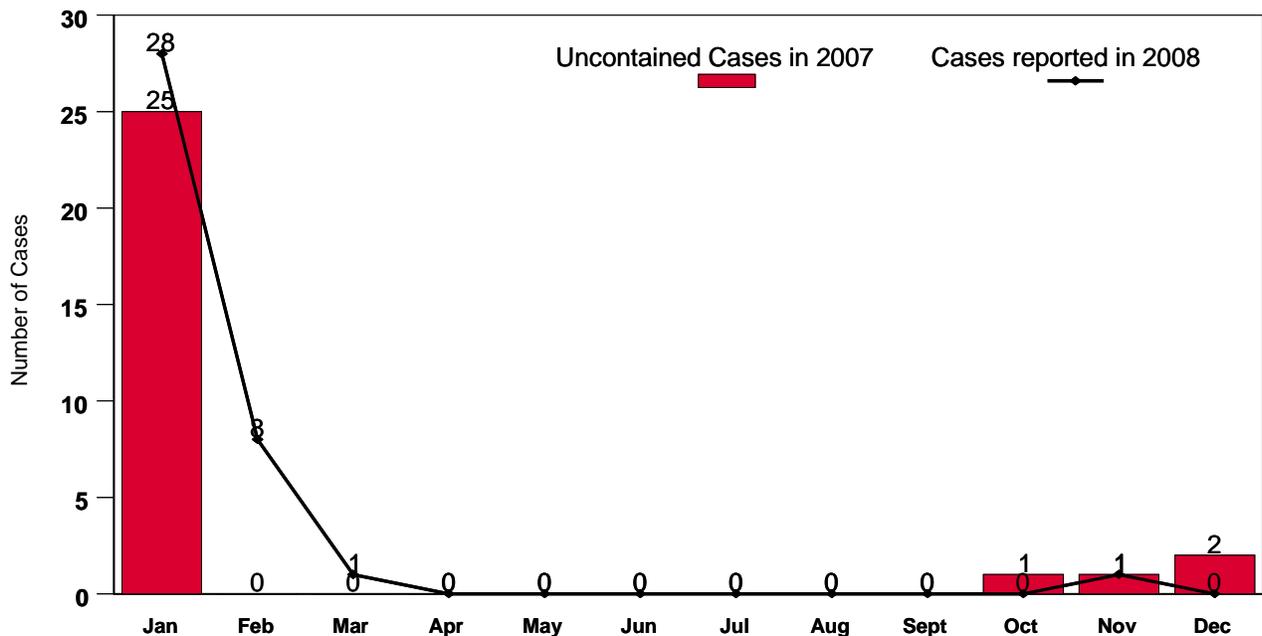


Figure 4

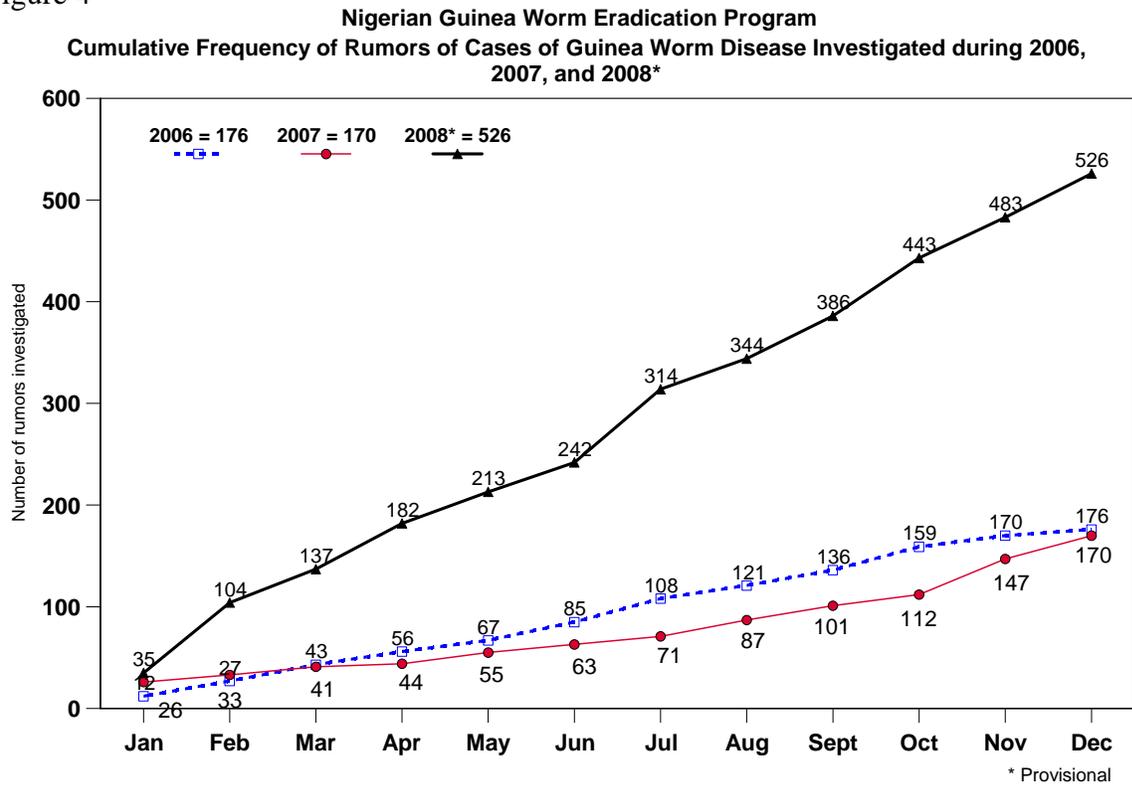
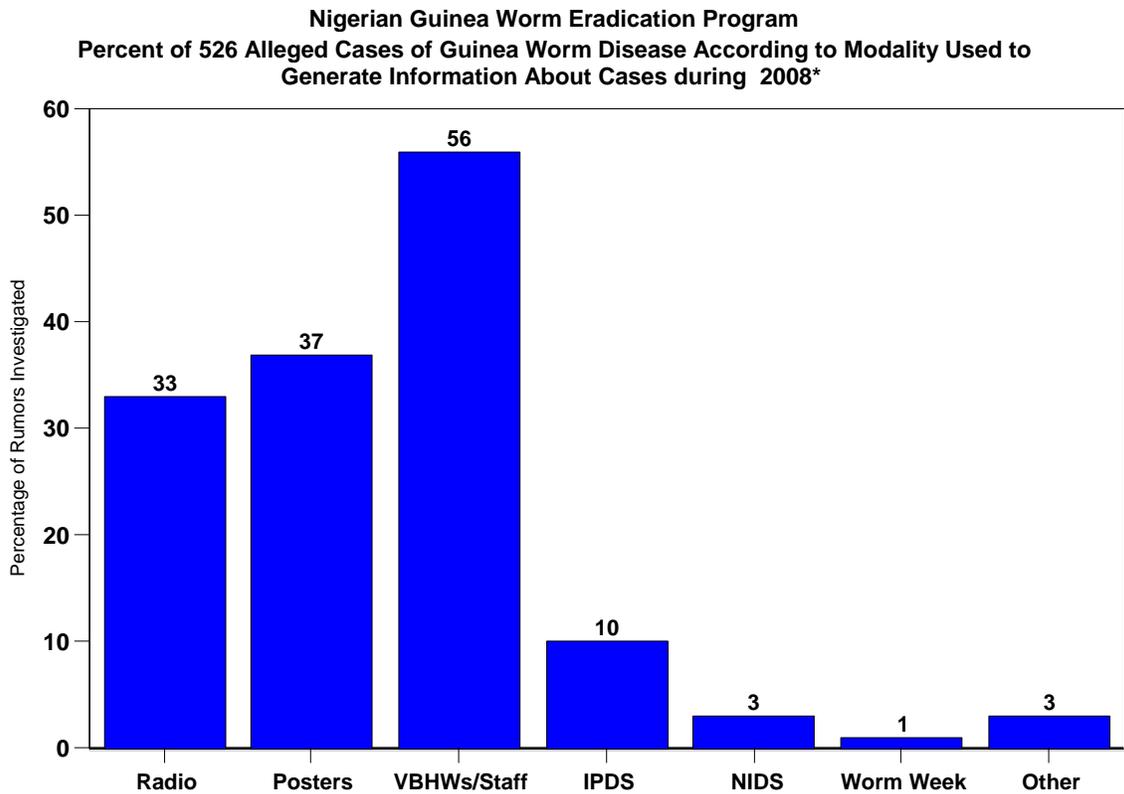


Figure 5



\* Provisional

Frequencies of modalities are not mutually exclusive.

VBHWs = Village-Based Health Workers; IPDS = Immunization Plus Days; and NIDS = National Immunization Days

Table 4

**Nigeria Guinea Worm Eradication Program  
Frequency and Percent of Outcome Conditions Resulting from  
Investigations of 526 Alleged Cases of Guinea Worm Disease in 2008**

| Condition               | Frequency  | %           |
|-------------------------|------------|-------------|
| Boil / ulcer / sore     | 156        | 30%         |
| Rheumatism / arthritis  | 84         | 16%         |
| Localized swelling      | 57         | 11%         |
| Scar or wound           | 44         | 8%          |
| False Allegation of GWD | 29         | 6%          |
| Varicose vein           | 28         | 5%          |
| Skin Rash               | 26         | 5%          |
| Lymphodema              | 15         | 3%          |
| Onchocerciasis nodule   | 13         | 2%          |
| Pain                    | 11         | 2%          |
| Itching                 | 9          | 2%          |
| Calcification           | 9          | 2%          |
| Myasis                  | 11         | 2%          |
| History of GWD          | 3          | 1%          |
| Other                   | 31         | 6%          |
| <b>TOTAL</b>            | <b>526</b> | <b>100%</b> |

Other includes: skin infection (4); diabetes (3); old age (3), filariasis (2); Hydrocoele (2); cellulitis (2); growth on leg (1); thorn in leg (1); blister (1); bone dislocation (1); Loasis (1); herbal poisoning (1); osteomyelitis (1); keloid (1); pyomyositis (1); athlete foot (1); injury (1); measles (1); old fracture (1); sprained ankle (1); and no entry for condition (1)

### **NIGER**

Niger reported only three cases of Guinea worm disease (GWD) in 2008 (Table 1, Figures 1 and 2), one of which was imported from Mali, in three different villages (Timbirga, Tifrat, and Tintihoune) of Tera (1 imported case, contained) and Tillaberi (2 indigenous cases, only 1 contained) Districts, in February, September and October, respectively. The uncontained case was identified four days before the worm emerged in October, but still managed to contaminate local water source(s). ABATE® Larvicide was applied in the village of the uncontained case in time to prevent transmission to others, and in one of the other two villages. This program recorded investigations of 154 suspect cases in its Rumor Registry in 2008, it offers a reward of 5,000 FCFA (~US\$11) for reporting of a case of dracunculiasis, and plans to increase its reward for reporting of cases in 2009 if Mali increases its reward. Niger established a National Commission for Certification of Dracunculiasis Eradication in October 2007. Niger has reported zero cases of GWD in January and February 2009 (Table 2, Figure 3).

### **ETHIOPIA**

In 2008, Ethiopia reported 41 cases, 9 of them reportedly uncontained (Table 1), in 11 communities, including 2 cases imported from Sudan: 1 into Gambella Region, and 1 into South Omo, SNNP Region, where transmission was stopped in 2001. All but one of the cases in Gambella Region are alleged by Ethiopia to have been infected in Sudan. However, the Ethiopian Dracunculiasis Eradication Program (EDEP) would be well advised to act as if inadequate surveillance caused cases to be missed during the 20+ months when Ethiopia thought transmission had been interrupted in Gambella. That would be the best way for all concerned to recognize how serious the current situation in Gambella really is, even if some of the cases there

were imported, and realize how much needs to be done to correct the deficiencies. We are also aware that during a number of years preceding the claimed interruption of transmission there were many periods of severe insecurity in Gambella Region because of conflict between the Agnuak people and “Ethiopian Highlanders” over land use, all of which interfered with program operations. Analysis of the line-listing of cases in 2008 shows that detection of several of the 9 uncontained cases in 3 villages of Gambella Region was badly delayed, leaving Ethiopia in danger of onward transmission, starting in March 2009. Awukoy village (39 cases overall) had 7 uncontained cases, on March 16 (4 days delay before detected), March 16 (31 days delay), March 21 (4 days), March 31 (15 days), April 3 (18 days), April 18 (2 days) and June 20 (15 days); Wankak village had 1 uncontained case on August 16, 2 days delay; and Tharpam village had 1 uncontained case (imported from Sudan) on August 30, 6 days delay. Knowing now that it did have uncontained cases on its territory in 2008, and knowing when and where those cases occurred, the challenge for the EDEP is to prove that it can detect, contain and explain whatever cases occur in Gambella or elsewhere in Ethiopia during 2009. Having had the benefit of last year’s wake up call, Ethiopia can rise to that challenge. Its actions in 2009 will determine whether it does so, and whether 2008’s embarrassment becomes a worse tragedy in 2009. The world is watching! The EDEP reported that it investigated “all” rumors in 2008, but presented no details, it offers a reward of 100 birr (~US\$10) for reporting of a case in villages under surveillance (in Gambella and South Omo) and 500 birr for reporting a case elsewhere in Ethiopia, and it re-established a National Pre-certification Commission in March 2008. Ethiopia has reported zero cases of GWD during January and February 2009 (Table 2 and Figure 2).

### **MALI**

Mali reported 417 cases, 354 (85%) of them contained, from 69 villages/sites in 2008 (table 1). This is an important improvement from the 35% of cases that were contained in 2007, but only 61% (69/114) of the cases in Gao Region were contained: 48% in Gao District and 65% in Ansongo District. Although Mopti Region finally reported zero indigenous cases for the first time, six cases, including 3 uncontained cases, of unexplained origin were reported from Segou Region, which is the only one of the southern regions of Mali to report cases in 2008. In 2008, there were also 45 uncontained cases in Gao Region, 8 uncontained cases in Timbuktu Region, and 7 uncontained cases in Kidal Region. Mali’s peak transmission season in 2008 was from May through November, with one case each in January and April, 4 cases in December, and no cases in February-March. No cases have been reported in January or February 2009 (Table 2 and Figure 2). Mali reported having investigated 12 rumors in 2008; it offers a reward of 5,000 (~US\$11) to 15,000 FCFA, depending on the case, everywhere except in Kidal Region; and it expects to establish a pre-certification commission in 2010. This program needs to intensify supervision in all endemic areas in order to improve early detection and containment of cases in Gao, Kidal, and Timbuktu Regions, and also take effective action to stop transmission in Segou Region. In order to improve surveillance in formerly and currently endemic areas the program plans to double its reward, beginning in 2009, for reporting of cases, as a more dynamic engine for generating reports about alleged cases of GWD is now needed for the Malian eradication effort to succeed.

### **GHANA**

Ghana reduced its reported cases drastically in 2008, reporting only 501 cases, of which 426 (85%) were contained (including 183 (37%) cases isolated in a Case Containment Center or health facility), from 131 villages, of which only 46 villages reported indigenous cases,

compared to 180 villages reporting indigenous cases in 2007. Household filter coverage improved from 70% to 75% of endemic villages with cloth filters in all households between 2007 and 2008, while coverage with pipe filters improved from 30% to 74% in the same period. As of March 11<sup>th</sup>, 117 cases had been reported so far in 2009, compared to 201 cases in January-March 2008. Of the 45 cases reported in January 35 were contained, 5 were not contained (3 of these were not detected within 24 hours), and 5 are still pending. Of the 50 cases reported during February, 30 are contained, 19 are pending containment, and 1 was uncontained. So far, 74 of the cases reported in 2009, were detected in Fulfulso Junction of Central Gonja District in Northern Region, and another 20 cases were exported from Fulfulso to other locations in the Northern (19) and Brong Ahafo (1) Regions. Transmission appears to have been blocked by case containment and/or application of ABATE® Larvicide within seven days for all cases reported in January. The program also knows the source of all cases reported in January and February, except one, which is still being investigated. Ghana's GWEP recorded investigations of 409 suspect cases, 57 of which confirmed as cases of GWD, in its Rumor Registry in 2008; it does not offer a cash reward for reporting of cases; and it is considering forming a National Commission for Pre-certification later in 2009.

### **SUDAN**

Sudan reduced its cases of dracunculiasis by -38% in 2008, to 3,618, from 5,815 cases in 2007. The cases in 2008 were reported from 1,243 villages, of which 947 villages were endemic. This is a -46% reduction in endemic villages since 2007. Only 49% of cases were contained in 2007 and again in 2008 (most uncontained cases in 2008 were in Kapoeta East, Kapoeta South, Tonj North, Tonj East, and Terekeka Counties), but several other indices improved between 2007 and 2008. The rate of reporting from endemic villages increased to 89% from 70%, cloth filter coverage increased to 79% from 39%, pipe filter coverage increased to 52% from 38%, and ABATE® Larvicide coverage increased to 34% from 11%. The program created over 20,000 radio listening groups and distributed 20,496 short wave radios. The proportion of endemic villages receiving monthly supervisory visits increased to 89% from 70%. Security challenges were severe in some areas during 2008, especially in parts of highly endemic Warrap State. This program will open four Case Containment Centers in 2009, compared to one pilot test center opened in 2008. So far the South Sudan Guinea Worm Eradication Program is not using Rumor Registers; it does not offer cash rewards for reporting of a case; and the government has not organized a pre-certification commission. The overriding objective for this program is to improve case detection and increase the rate of case containment in 2009. Of the 11 cases reported in January 2009 (provisional data), which is a reduction of -66% from 32 cases (25% containment) reported in January 2008, only 2 cases (18%) were contained.

### **IN BRIEF:**

On February 21, 2009, the Government of Togo held a ceremony at Kpele, in Haho Region, to celebrate the interruption of indigenous transmission of dracunculiasis in the country. The ministry of health thanked the major partners, The Carter Center, WHO, UNICEF, and U.S. Peace Corps for their support during the eradication campaign. The ceremony also served to inform the population, improve surveillance, launch a reward system, and launch the official pre-certification commission.

## MEETINGS:

WHO has announced workshops to strengthen capacity of national Guinea Worm Eradication Programs in surveillance and data management. A workshop for French-speaking countries will be held in Ouagadougou, Burkina Faso during April 7-9 and one for English-speaking countries will be held in Addis Ababa, Ethiopia during April 22-23, 2009.

## RECENT PUBLICATIONS

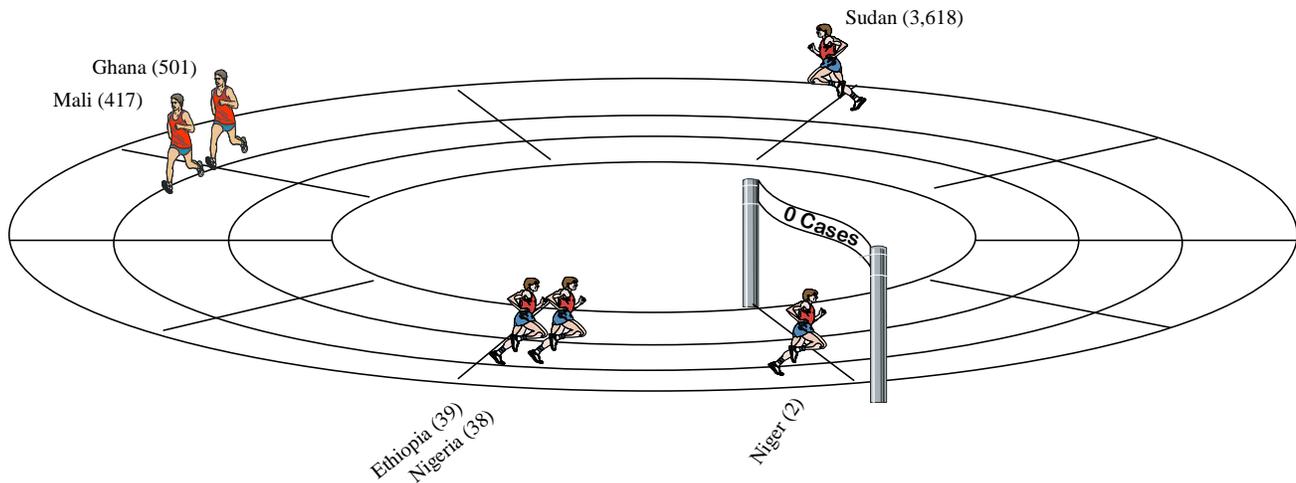
World Health Organization, 2009. Dracunculiasis: gearing up for eradication. Action Against Worms. Issue 13 (February).

Rinaldi, A., 2009. *Free, at last! The progress of new disease eradication campaigns for Guinea worm disease and polio, and the prospect of tackling other diseases*. EMBO Reports 10 (3): 15-21

*“Ah! The fierce urgency of stopping transmission of Guinea worm disease in 2009!”*  
- An old Guinea worm warrior

Figure 6

# GUINEA WORM RACE: 2008\*



\* Provisional  
Indigenous Cases only

*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 the WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis, NCZVED, 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.