DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control
and Prevention (CDC)

Memorandum

Date: June 15, 2001

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

Subject: GUINEA WORM WRAP-UP # 113

To: Addressees

Detect Every Case (within 24 hours), Contain Every Worm (immediately)!

U.S. PEACE CORPS VOLUNTEERS ATTACK GUINEA WORM IN FIVE COUNTRIES

U.S. Peace Corps Volunteers (PCVs) in at least five countries are escalating their efforts in support of national Guinea Worm Eradication Programs (GWEP). "Worm Weeks" have already been held or are planned for later this year in Burkina Faso, Cote d'Ivoire, Ghana, Niger, and Togo. The "Worm Week" methodology was developed by PCV Michael Kinzer in Niger five years ago. In it, PCVs and national counterparts spend a week living in endemic villages while conducting intensive health education and community mobilization, as well as demonstrating and distributing cloth filters. Associate Peace Corps Director Claude Milogo reports that 40 PCVs in **Burkina Faso** conducted their first Worm Week beginning April 16 this year in cooperation with the GWEP. The Worm Week was held in Ouahigouya District, which was Burkina Faso's second-highest endemic area in 2000. In **Cote d'Ivoire**, PCVs and the GWEP conducted Worm "Weeks" in Dabakala May 30-June 1, and in Bouna June 3-5, in advance of the peak transmission seasons there. Those two sanitary districts reported the 6th and 2nd highest number of cases, respectively in Cote d'Ivoire in 2000. This program has been funded by Global 2000 of The Carter Center to conduct fifteen "Worm Days" in the most endemic villages this year. Worm days were conducted in February-June 2001 in 12 endemic villages which contained over 70% of all cases. **Niger** conducted Worm Weeks in Mirriah (Zinder Region) and in Tera (Tillabery Region) Districts, the two highest endemic districts in the country, during the week of May 24-June 2 (in Mirriah) and May 24-31(in Tera). In Mirriah, 30 teams of 21 U.S. and 13 Japanese volunteers (JOCVs) and their 34 Nigerien counterparts lived in 29 of the most endemic villages of the district. About 6,000 people were reached by these teams. In Tera 19 U.S., 1 JOVC, and 20 Nigerien counterparts lived in 20 of the most endemic villages for one week and reached about 8,000 people with their educational messages and distributed about 7,500 filters. A second Worm Week is planned for Zinder Region in late July or early August. The coordinators for Worm Week in Mirriah were Mr. Oumarou Brah and Dr. Siddo (ministry of health), Melissa McSwegin and Kelley Sams (PCVs), and Kaori Nishiyama (JOCV). In Tera the coordinator was Alison Mitchell (PCV), and Akiko Kageyama (JOCV). **Ghana's** PCVs and GWEP plan to hold a Worm Week in Nanumba, Ghana's highest endemic district, on October 6-13, 2001.

Togo's GWEP and PCVs plan to conduct their next Worm Week in Ogou, Haho and Yoto Districts July 30-August 4, 2001. These are the 1st, 3rd, and 6th highest endemic districts in Togo so far in 2001. With financial support from Global 2000/The Carter Center, PCVs in Togo have helped the inhabitants of 13 endemic villages of Ogou Prefecture to construct 14 hand-dug wells at a cost (for cement and other materials for lining the wells) of under $100 per well. This low cost technology approach has thus helped provide safe drinking water to a significant proportion of Togo's remaining endemic villages quickly and inexpensively. They have also repaired four pumps, helped the GWEP to re-train 87 animators in 79 villages (Ogou, East Mono), conducted market place education sessions in 13 villages (Ogou, East Mono), trained 198 teachers in 63 schools (Ogou, East Mono), provided a theater group presentation in 18 villages (Ogou, East Mono), and ensured daily radio broadcasts of Guinea worm health education messages in five

local languages to all of Ogou and over half of Haho Districts throughout 2001. The report of Togo's PCV activities was provided by APCD Tchao Bamaze, and PCVs Roger Phillips, Kathleen Silliman, and Kim Williams. Bravo!! UNICEF/Togo supported additional theater group presentations, and also provided the Guinea worm comic books that were distributed in the Peace Corps' teacher training sessions.

EDITORIAL

IMPROVING THE EFFICIENCY AND EFFECTIVNESS OF CASE CONTAINMENT

Efficiency is concerned with doing things right, effectiveness is concerned with doing the right things. (Peter Druker)

The strategy of containing transmission from each case of dracunculiasis was conceived during the late 1980s and was first implemented in Pakistan in 1991, when 106 cases were reported from 35 endemic villages (Kappus, et al., 1991, and Hopkins et al., 1995). Embarking on containment of individual cases assumes that other village-based interventions, e.g., distribution of filters, use of Abate, are already in place. The standards adopted to judge whether transmission from a case of dracunculiasis is contained or not were developed in Pakistan and adopted internationally in a set of guidelines in 1994: Case Containment Strategy for Eradication of Dracunculiasis in Africa. Although the Guinea Worm Eradication Programs (GWEPs) in Cameroon and Ghana began implementing the case-containment strategy in 1992, it was not until 1994 that the majority of other national eradication programs in Africa began to do so as well.

So far in Africa, the success of this strategy in accelerating the interruption of transmission has been variable, succeeding in Cameroon, Chad, and Senegal, but less so in other countries. The 1994 Guidelines clearly explain that this strategy should be implemented when the number of cases per village per year approximates 100 or less (for case management), 35 or less for case-containment, and 16 or less for intensified case containment. These levels of containment and the standards to meet them were proposed because the frequency and quality of supervision of village volunteers was expected to increase incrementally as cases of the disease diminish until transmission is stopped. As GWEPs in Africa developed in the mid 1990s, the practice was to observe the recommendations and standards provided in the 1994 Guidelines only loosely, while continuing to scale-up the implementation of the strategy, and without making sure that the frequency and quality of supervision would be sufficient to ensure compliance with the standards for case containment. The results of such weak adherence to standards have been annual claims of high rates of cases contained that have little relationship with the observed reductions in the number of cases reported the following year. Intense efforts during the last 3-4 years to improve the frequency and quality of supervision in all of the programs have begun to yield results, but much more remains to be done. The question now is whether improving supervision of all interventions against dracunculiasis, including the sensitivity of surveillance and the efficiency of case containment, can be done rapidly enough to halt transmission everywhere outside of Sudan by the end of 2002. We believe this is feasible, but it will require a major effort from all concerned to stay focused on continuing to improve the efficiency of these interventions (doing things right) everywhere.

As cases of dracunculiasis continue to plummet this year (see table of cases reported and % change graphic in this issue) there will be more and more localities suitable for the implementation of intensified case containment. However, village volunteers and supervisors will continue to be challenged by the great difficulty in ensuring that once detected, individuals with emerging worms will not contaminate sources of drinking water. In the absence of some enticement to the patient for staying in a secure place while the worm(s) are pulled out, it is naïve to expect village volunteers to be able to convince most cases to stay in a secure place, which is what too often has happened, allowing transmission to occur. One possible way of circumventing this inherent shortcoming of the case containment strategy is for ministries of health and or

GWEPs to adopt a policy of requiring all cases of dracunculiasis to be isolated either in a "containment house" in a centralized endemic village (if the nearest health post is too far away to make it practical for cases to travel there), or at health facilities that may be close by. The quarantine/isolation of cases of communicable diseases with epidemic potential has a long history and application in public health practice. Dracunculiasis is one such communicable disease, and although slated for eradication, there is no medication to treat it nor vaccine to prevent it. Isolation of cases is one action that ministries of health can undertake nation-wide that will help improve the effectiveness of case containment (doing the right thing), and one great opportunity for having the primary health care system help with the eradication of dracunculiasis.

Nigeria's most endemic village, Turtsawa, in Sabon Birnin LGA, Sokoto State, reported a total of 123 cases in 2000, and only two other villages (out of 906 that reported 1 or more cases in 2000) reported 100 or more cases. Ghana's most endemic village, Parambo East, in Atebubu District, Brong Ahafo Region, reported a total of 273 cases in 2000, and only four other villages (out of 981 reporting 1 or more cases in 2000) reported 100 or more cases. Clearly, caseloads in the vast majority of endemic villages are well within the ideal range for intensified case containment. Moreover the expected per day case load during 2001 and 2002 should not overwhelm village volunteers, containment houses**,** or health posts.

The biology of the Guinea worm also favors case containment. It is known that the total number of first-stage larvae per worm ranges from 1.4-1.9 million, and it is also known that the highest number of larvae (perhaps 50% or greater) by far, released by the worm occurs during the first immersion of the worm in water (Muller, 1971). That underscores the fundamental reason for the need to detect all cases before or within 24 hours of the emergence of the worm. Another important aspect of the biology of this parasite is that the physiological age of the first-stage larvae is relatively uniform, given the narrow window of opportunity that Guinea worms have to propagate themselves, and this is buttressed by the observation by Muller (1971) that although first-stage larvae remained motile in water for 4-7 days, infection rates in Cyclops fell sharply after 3 days in water and was nil after 6 days. The implications are firstly, that it is of outmost importance to detect cases on or before emergence of the worm to prevent the first and most copious release of larvae into sources of drinking water and secondly, that if cases can be kept in a safe place, i.e., containment house, health posts, hospitals etc., for about 7 days, the transmission potential of those infections is essentially neutralized.

This idea of isolating and containing transmission from cases is being practiced with success in Ethiopia where rustic "Guinea worm houses" are in use, and in Uganda where all Guinea worm patients are taken to the nearest health post or hospital. The Ghana and Togo GWEPs are now piloting similar approaches of containing cases. Experiences so far indicate that success depends on thinking carefully about what it takes to run such facilities (food, water, sanitation, incentives, etc.) and to ensure that each patient is well cared for, so that he/she returns to the village with a positive story about the experience. Stories of abuses or mistreatments of patients would do irreparable damage to the credibility of the initiative. The isolation of cases combined with a system of rewards has the potential of greatly increasing the effectiveness of case containment efforts and of stopping transmission sooner. Given the enormous efforts already undertaken to reduce the incidence of dracunculiasis by 98%, stopping transmission of dracunculiasis outside Sudan by 2002 is an urgent priority for all endemic countries and collaborating organizations. It is far better to be bold now; it would be a sin not to make the attempt.

References

1. Kappus KD, Hopkins DR, Ruiz-Tiben E, Imtiaz R, Andersen J, Azam M, and Attiq A. 1991. A strategy to speed up the eradication of dracunculiasis. *World Health Forum*, Vol. 12: 220-225.
2. Guidelines—*Case Containment Strategy for Eradication of Dracunculiasis in Africa*. 194. Centers for Disease Control and Prevention, in collaboration with Global 2000 Program/The Carter Center, UNICEF, and the World Health Organization. 23 pages.
3. Hopkins DR, Azam A, Ruiz-Tiben E, and Kappus KD. 1995. Eradication of dracunculiasis from

Pakistan. *The Lancet*, Vol.346: 621-624.
4. Muller R. 1971. Dracunculus and dracunculiasis. *Advances in Parasitology*. Vol. 9: 73-151.

MORE THAN 8 MILLION PIPE FILTERS COMPLETED FOR SUDAN

As of June 8, eight million of the projected 9 million pipe filters for Sudan had been completed by the teams of over 1,300 Kenyan, Sudanese and Ethiopian workers in Nairobi, and seven million of the filters had been shipped to distribution points in Sudan. The remaining filters are expected to be completed by mid-June. The filters are being distributed to all persons in at risk areas of Sudan to wear around their neck for quick availability and ease of use. They are being distributed by 39 international and indigenous Non-Governmental Organizations (NGOs), the Federal Ministry of Health, the Sudan Relief and Rehabilitation Association, RASS, FRRA, and United Nations Organizations. The partner NGOs, Global 2000 field officers, and radio broadcasts are being used to mobilize persons at risk of dracunculiasis throughout Sudan to use the pipe filters. A high level team of representatives of Hydro Polymers of Norsk Hydro (Mikkel Storm), Chemical Workers Union of Norsk Hydro (Jon Selmer), and Health and Development International (Dr. Anders Seim), and Norwegian Church Aid (Atnaf Kebreab), visited Khartoum (arrival of first shipment of pipe filters), Nairobi (manufacture of the pipe filters), Lokichokio Kenya (distribution) and Alek, Sudan (distribution and use of pipe filters, saw over 50 persons with Guinea worms) where they viewed the full scope of the ambitious project from May 13-22. To receive the first shipment of filters at Khartoum airport, the visitors were joined by a delegation of Sudanese officials, led by the Federal State Minister of Health, Mr. Mabyor Makoy. A press conference was held at the offices of The Carter Center in Nairobi on May 22. Reports of the project have so far appeared on the front pages of newspapers in Khartoum, Atlanta, Oslo, and Nairobi, as well as on Voice of America and British Broadcasting Corporation radio broadcasts and Sudanese radio and television. A story by the Associated Press is also expected soon. The major supporting partners for this project are Hydro Polymers of Norsk Hydro, Government of Norway, Health and Development International, Norwegian Chemical Workers Union, Norwegian Church Aid, and The Carter Center.

The only indigenous cases of dracunculiasis in East Africa during the first quarter of 2001 were in southern Sudan. The northern states of Sudan have reported 3 indigenous (all in April) and 4 imported (from southern Sudan) cases in January-April 2001, as compared to 1 indigenous and 2 imported cases in the same period of 2000.

GHANA AND NIGERIA'S CASES CONTINUE TO FALL, INTERVENTIONS IMPROVING

Ghana and Nigeria continue to record substantial advances against dracunculiasis. Both national Guinea Worm Eradication Programs are intensifying interventions, but Ghana's Northern Region, which reports over half of the country's cases, has not reported recently on the number of households in its endemic villages or on the proportion of those endemic villages that have cloth filters in 100% of households- hence the under-representation of Ghana's filter coverage in the Box Score below. Ghana and Nigeria have reported cumulative reductions in cases so far this year of -48% (through April) and –30% (through May), respectively, compared to the same periods of 2000. The cumulative numbers of indigenous cases reported by these two key countries up to now in 2001 are: 2,678 (Ghana, through March) and 3,335 (Nigeria, through April). The status of cases and locations of the highest endemic districts remaining in Ghana are shown on the map and graphics in Figure 1. As of late May 2001, four of the ten borehole wells being drilled in endemic villages of Ghana's Atebubu District had been completed. A full report on this project will be included in next month's issue. Of Nigeria's six highest endemic Local Government Areas (LGA) (see *Guinea Worm Wrap-Up # 112*), Ohaukwu, Isi Uzo, and Ikwo have now recorded reductions of –65%, -68% and –68%, respectively in January-May. The percentage changes in Ebonyi, Ado and Ezza North

LGAs are –35%, +198% and +4435%, respectively.

Table 1

Box Score	Ghana (April)	Nigeria (May)
Cumulative # endemic villages (EVs)	1,128	1,132
% EVs reporting	95%	100%
% EVs with 100% filters	22%	89%
% EVs using Abate	6%	35%
% EVs with any safe water	39%	53%
% of cases contained	73%	84%
% reduction in cases in month indicated	-33%	-61%

IN BRIEF:

Mauritania. National Program Coordinator Dr. Abderrhamane Ould Kharchi reports that this GWEP will hold a National Guinea Worm Day on June 14, 2001. Global 2000/The Carter Center is providing a grant of $25,000 to help support surveillance and health education/community mobilization efforts, as well as filter material and Abate.

Cote d'Ivoire. Dr. Alhousseini Maiga of WHO consulted during a visit to this program on May 23-June 4. He met with ministry of health officials and representatives of the principal partners, and visited four sanitary districts and four endemic villages. He noted that only 25% of the 114 cases of dracunculiasis that have been reported from Tanda District so far this year were contained.

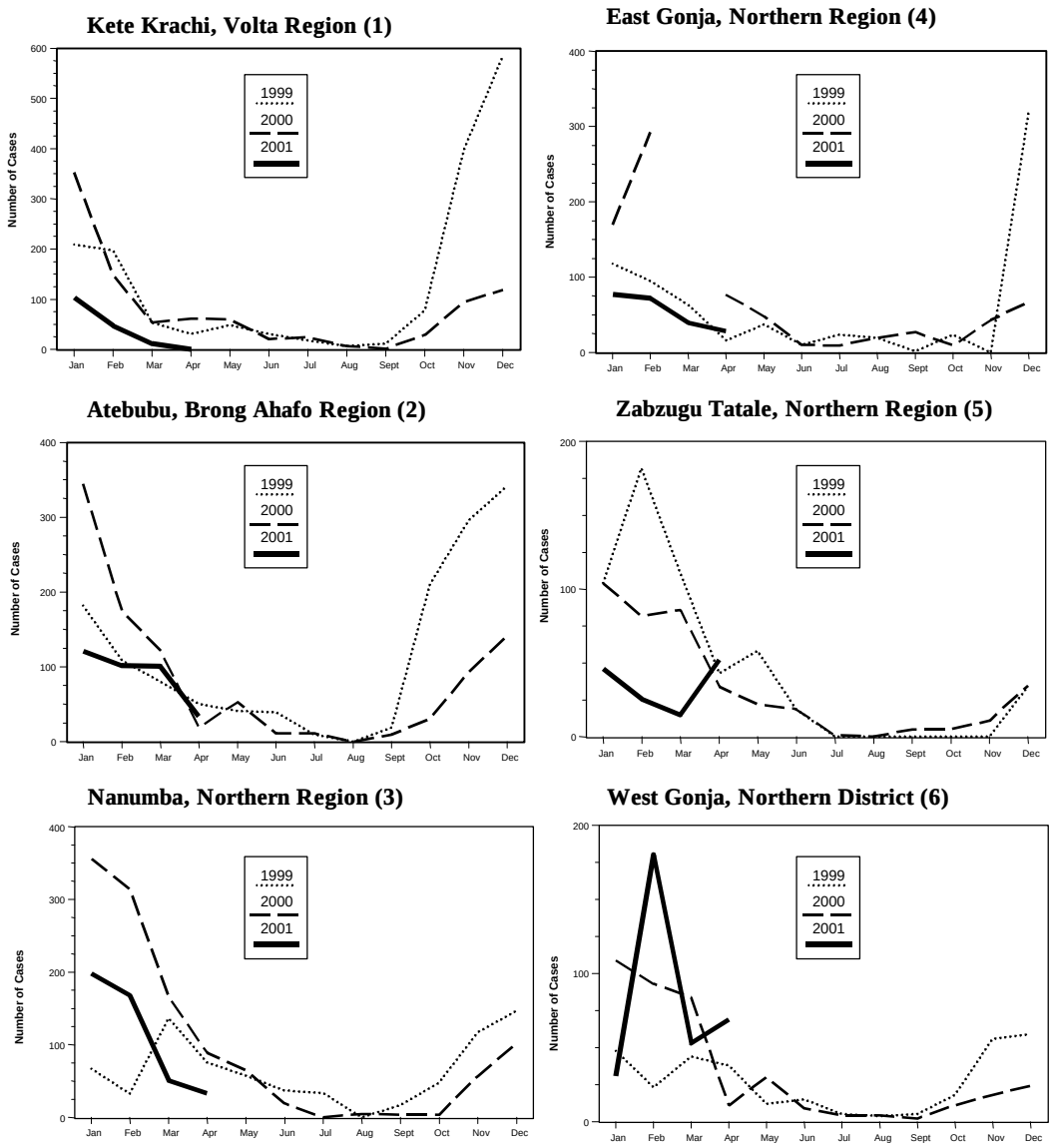
Niger and Nigeria's GWEPs held a cross-border meeting in Jos, Nigeria on May 30-June 2. About 25 officials from the two countries attended. Regions of Niger Republic that were represented included Maradi, Zinder, Dosso, and Madaoua. The Nigerian delegates included officials from the state ministries of health of Sokoto and Katsina, as well as Global 2000 personnel from national and zonal (NW and NE) levels. The two delegations reviewed implementation of recommendations from the previous meeting, exchanged data on imported cases and on the epidemiological situation and status of interventions along the borders, and discussed the reward system.

Uganda. National Program Coordinator Dr. John Bosco Rwakimari met briefly with Former U.S. President Jimmy Carter in Kampala during President Carter's visit to Uganda on June 7. President Carter congratulated Dr. Rwakimari on the dramatic progress of the Ugandan GWEP. Drs. Ahmed Tayeh and Alhousseini Maiga of WHO visited with the Dr, Rwakimari during mid May to assess the status of eradication efforts.

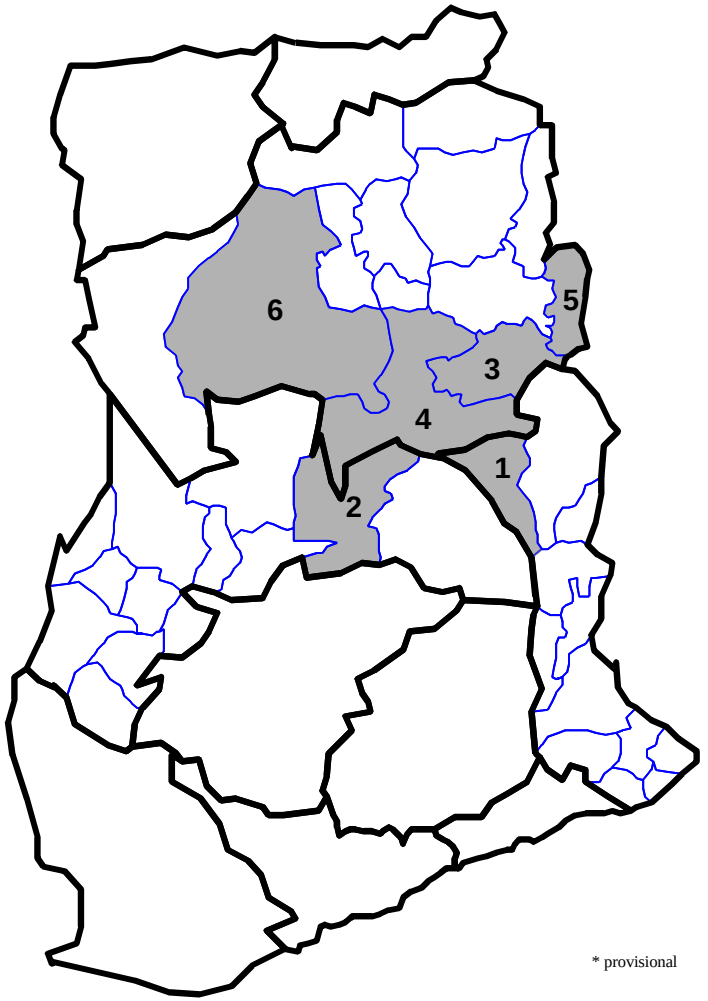
Kenya. Dr. Ahmed Tayeh, of WHO visited Kenya in late May and reports that 3 imported cases of dracunculiasis were detected sometime during January – May 2001 in the Turkana District. Two of the cases were Sudanese refugees and one case was a Turkana person who had a history of travel in endemic areas within southern Sudan during the preceding year.

Burkina Faso. UNICEF has rehabilitated 8 traditional wells in Niessega FS village of Ouahigouya Sanitary District. This was the second-highest endemic village in the country in 2000, reporting 74 cases.

Figure 1



Ghana Guinea Worm Eradication Program
Number of Cases of Dracunculiasis Reported During 1999, 2000, and 2001*
From Six Most Endemic Districts



* provisional

Table 2

Number of cases contained and number reported by month during 2001*
(Countries arranged in descending order of cases in 2000)

COUNTRY	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED													%
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL*	CONT.
SUDAN	753 / 2052	886 / 1816	493 / 1600	410 / 1002	/	/	/	/	/	/	/	/	2542 / 6470	39
NIGERIA	673 / 1042	813 / 1051	423 / 730	170 / 267	208 / 248	/	/	/	/	/	/	/	2287 / 3338	69
GHANA	612 / 845	676 / 919	365 / 474	322 / 440	/	/	/	/	/	/	/	/	1975 / 2678	74
BURKINA FASO	18 / 20	8 / 12	32 / 34	34 / 57	/	/	/	/	/	/	/	/	92 / 123	75
NIGER	**1 / 2**	2 / 2	**0 / 0**	**1 / 2**	9 / 13	/	/	/	/	/	/	/	13 / 19	68
TOGO	108 / 119	63 / 91	58 / 66	43 / 48	11 / 15	/	/	/	/	/	/	/	283 / 339	83
MALI	3 / 6	**0 / 0**	**0 / 0**	**0 / 0**	/	/	/	/	/	/	/	/	3 / 6	50
COTE D'IVOIRE	18 / 40	18 / 60	11 / 38	5 / 6	2 / 9	/	/	/	/	/	/	/	54 / 153	35
BENIN	12 / 16	13 / 13	6 / 6	3 / 3	/	/	/	/	/	/	/	/	34 / 38	89
MAURITANIA	1 / 1	**0 / 0**	0 / 1	**0 / 0**	/ 1	/	/	/	/	/	/	/	1 / 3	
UGANDA	**0 / 0**	**0 / 0**	**0 / 0**	3 / 3	6 / 19	/	/	/	/	/	/	/	9 / 22	
ETHIOPIA **	**0 / 0**	**0 / 0**	**0 / 0**	**1 / 1**	2 / 5	/	/	/	/	/	/	/	3 / 6	
KENYA ***	/	/	/	/	**/ 3**	/	/	/	/	/	/	/	0 / 3	
C.A.R.	/	/	/	/	/	/	/	/	/	/	/	/	0 / 0	
TOTAL*	2199 / 4143	2479 / 3964	1388 / 2949	992 / 1829	238 / 313	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	7296 / 13198	55
% CONTAINED	53	63	47	54	76								55	

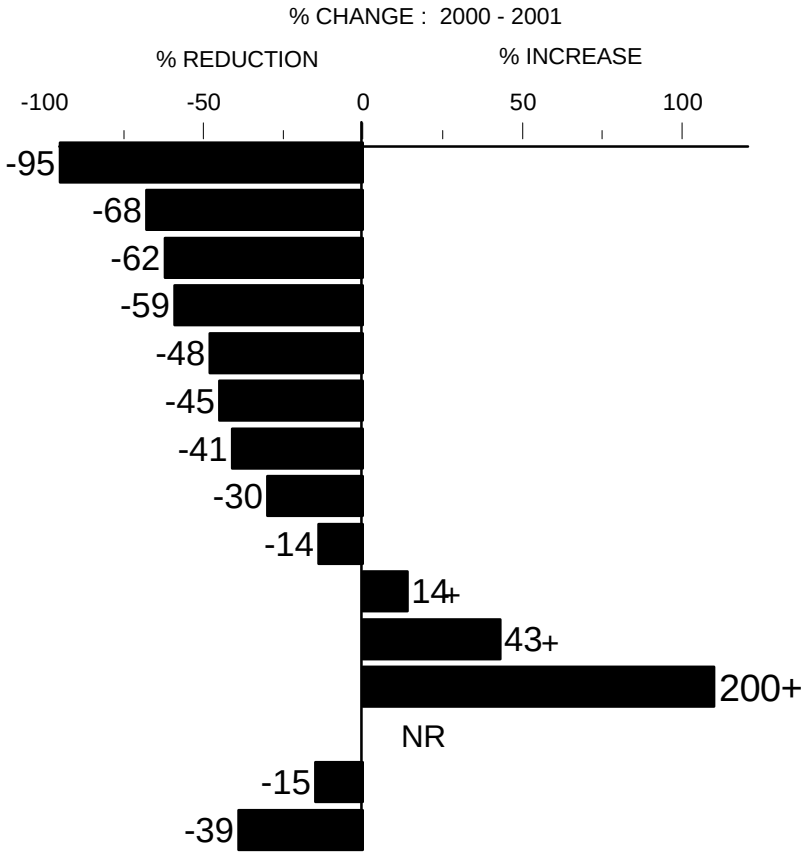
* PROVISIONAL

** 3 of 5 cases in may were imported from Sudan.
Shaded cells denote months when zero indigenous cases were reported. Numbers indicate how many imported cases were reported that month.

Figure 2

Percentage of Endemic Villages Reporting and Percentage Change in Number of Indigenous Cases of Dracunculiasis During 2000 and 2001*, by Country

COUNTRY	ENDEMIC VILLAGES		CASES REPORTED	
	REPORTING 1+ CASES 2000	% REPORTING**	2000	2001
ETHIOPIA (5)	18	100	41	2
BENIN (4)	61	98	93	29
NIGER (5)	95	100	39	14
BURKINA FASSO (4)	292	77	300	123
MALI (4)	62	85	11	6
GHANA (4)	981	99	5158	2678
UGANDA (5)	39	100	37	22
NIGERIA (5)	906	100	4778	3338
COTE D'IVOIRE (5)	54	100	177	152
TOGO (5)	147	100	297	339
SUDAN** (4)	3386	30	4518	6470
MAURITANIA (5)	22	100	1	3
CENT. AFRICAN REP.	15	NR		NR
TOTAL*	6087	50	15450	13176
TOTAL (without Sudan)*	2701	99	10932	6706



* provisional

** 2,600 (33%) of 7,898 endemic villages are not accessible to the program

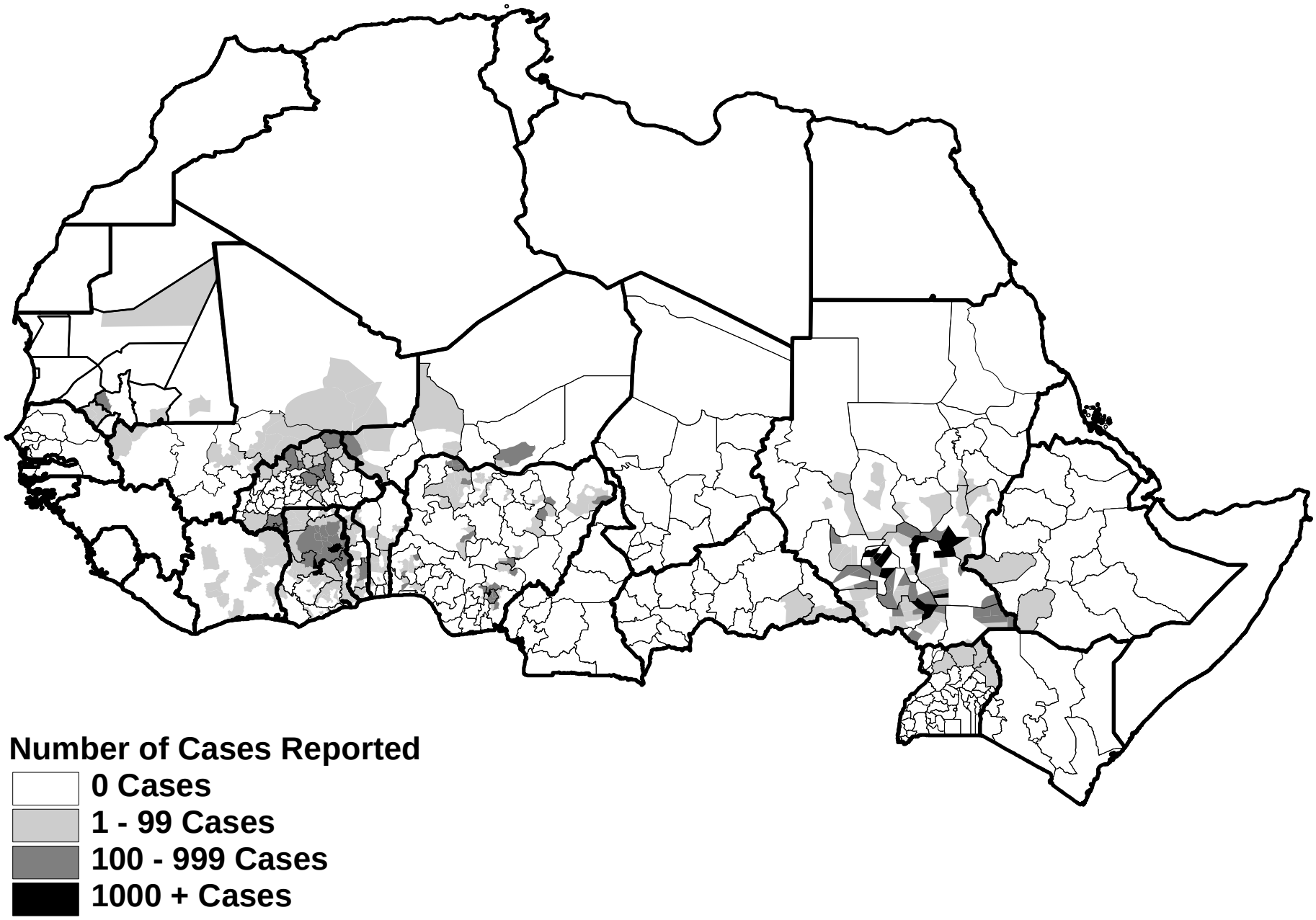
Table 3

DRACUNCULIASIS ERADICATION CAMPAIGN
REPORTED IMPORTATIONS AND EXPORTATION OF CASES OF DRACUNCULIASIS IN 2001

From --> To	Month and number of cases imported													Number of cases exported
	Jan.	Feb.	Mar.	Apr.	May	Jun	Jul	Aug.	Sept	Oct	Nov	Dec.	Total	
Togo --> Benin	5	1		1	1									Togo = 8
Sudan --> Ethiopia				1	3									Sudan = 7
Sudan --> Kenya					3									
Ghana --> Benin		1												Ghana=2
Ghana --> Niger				1										
Benin --> Niger	2													Benin=2
Nigeria --> Niger				1	1									Nigeria = 2
Burkina Faso --> Cote d'Ivoire					1									Burkina Faso=1
Total	7	2	0	4	9	0	0	0	0	0	0	0	22	

Map 1

Distribution of Reported Cases of Dracunculiasis: 2000



DEFINITION OF CASES CONTAINMENT

A case of Guinea worm disease is contained if **all** of the following conditions are met:

1. The patient is detected before or within 24 hours of worm emergence; **and**
2. The patient has not entered any water source since the worm emerged; **and**
3. The village volunteer has properly managed the case, by cleaning and bandaging until the worm is fully removed, and by giving health education to discourage the patient from contaminating any water source (if two or more emerging worms are present, the case is not contained until the last worm is pulled out; **and**
4. The containment process, including verification that it is a case of Guinea worm disease, is validated by a supervisor within 7 days of the emergence of the worm.

CORRECTION AND UPDATE: UN FOUNDATION FUNDS FOR WATER SUPPLY IN NIGERIA

We have received new information from UNICEF/Nigeria in response to the Editorial Note in *Guinea Worm Wrap-Up # 111* regarding delayed use of funding from the UN Foundation for providing safe water to Guinea worm endemic villages. The $200,000 was only released to UNICEF/Nigeria "on 1 August 2000", not before January 2000, as stated in the editorial. Moreover, we are informed that "$171,434.75 had been committed by March 2001 in ordering hand pumps and other materials for repair of broken down pumps". We regret the error, which reflected information available to other partners of the Nigerian program at the time. We hope to inform readers later of the endemic villages to be served by these hand pumps in a future issue.

INTERAGENCY MEETING AND MEETING OF GATES COMMITTEE

UNICEF hosted the 41st Meeting of the Interagency Coordinating Group for Dracunculiasis Eradication at its headquarters in New York on May 29. Representatives of CDC, The Carter Center, WHO, World Bank, and U.S. Peace Corps attended, in addition to staff of UNICEF. The group agreed to convene a Program Review for francophone endemic countries in October this year. The Second Meeting of the Gates Guinea Worm Committee met immediately following the meeting of the Interagency Group. The Gates GW Committee includes representatives of WHO, The Carter Center, The World Bank, and UNICEF.

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. Daniel Colley, Acting 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) 488-4532. The GW Wrap-Up web location has changed to http://www.cdc.gov/ncidod/dpd/parasites/guineaworm/default.htm

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