



Date: May 30, 2008



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

Subject: GUINEA WORM WRAP-UP #181

To: Addressees

*Number of uncontained cases of dracunculiasis outside of Sudan so far in 2008: 60 in Ghana; 5 in Ethiopia, Zero in Mali, Nigeria, and Niger.*

### **ETHIOPIA REPORTS MORE CASES: ORIGINS DISPUTED**

In early April 2008, the Ethiopian Dracunculiasis Eradication Program (EDEP) received reports of several cases of dracunculiasis in Gog Woreda (also known as Gillo District) in Gambella Region. Worms had begun emerging from many of the cases in March. A total of 27 cases were reported in March and April, of which 19 were females and 18 were 15 years old or older. All of the cases are Ethiopian citizens and belong to the Agnuak ethnic group. An investigation by the EDEP reported that all of the patients had a history of travel to southern Sudan in early 2007, especially the town of Pochalla and surrounding villages in Pochalla County, where they presumably got infected. The EDEP notified the Southern Sudan GWEP immediately.

Three ponds suspected to have been contaminated in Awukoy village in Gog Woreda were treated with ABATE<sup>®</sup> larvicide within 14 days after possible contamination. Two female patients ages 15 and 17 were diagnosed and contained in the town of Gambella; 20 of the 26 other cases were admitted to a case containment center at Gog Janjior clinic, located 32 kilometers from a camp for Sudanese refugees at Pugnido Town. All village volunteers were alerted and told to report any suspected cases as quickly as possible. One person was assigned to the most frequently used border crossing area to watch for patients with the disease, educate travelers, and treat a nearby pond.

A team from South Sudan's Ministry of Health and from the offices of WHO and The Carter Center in Southern Sudan conducted a joint mission to Pochalla County from April 30 to May 14, accompanied by a health worker from Ethiopia. They surveyed 15 villages, and interviewed 34 community leaders and hundreds of villagers. They were able to confirm two of the cases reported by the EDEP to have visited Sudan between January-May 2007, but no others. The survey also reported finding evidence of four cases imported from Gog Woreda into Pochalla County, two of whom had already returned to Ethiopia at the time of the active case search. The team concluded that "All of the guinea worm cases reported as importation from Pochalla to Gog Woreda in Gambella Region (Ethiopia) are more likely a result of indigenous transmission in Ethiopia ..."

A team of five persons assembled by WHO visited the affected areas of Gambella Region in May. They reported that they could not conclude whether the recent cases were indigenous or imported from Sudan, but two of the patients they interviewed denied having traveled to Sudan last year.

According to the EDEP, Gog Woreda has reported no cases of Guinea worm disease since 2006, when Ethiopia reported only one indigenous case in the entire country, a resident of Awukoy village, in Gog Woreda, who was detected and contained in Gambella Town in June. Ethiopia reported no indigenous cases of dracunculiasis in 2007, and only three imported cases (from Sudan into an area much further south), all of them reportedly contained, in June. Awukoy village was the home of all 13 indigenous cases reported in Ethiopia in 2003, and was the location or source of 21 of the 29 indigenous cases reported by Ethiopia in 2005 (April-August). The peak transmission season for dracunculiasis in Gambella Region has traditionally been April- August.

According to health officials in South Sudan, Pochalla County has never reported a case of dracunculiasis since Sudan's Guinea Worm Eradication Program began over a decade ago. Thus Pochalla County is one of the counties in South Sudan that has been presumed to be GW-free and has no formal surveillance for the disease, except for periodic questioning during Polio Immunization Days. The nearest known endemic area in South Sudan is just south of Pochalla County, in neighboring Pibor County (Figure 1), Pibor County reported 55 cases, none of them contained, in 31 endemic villages in January-June 2007. 50 of the 55 cases occurred in Kassingor Payam, which was the location of 3 villages with 5 or more cases each: Nawuyapurm (1 case in February, 3 in March, 2 in April), Kanamuge (3 cases in March, 3 in May), and Nakaluwat (5 cases in April), with a reporting rate of 41 %.

People of the Agnuak ethnic group, who are mostly farmers, live on both sides of the international border, in Pochalla County of Sudan and Gog Woreda of Ethiopia, and many Agnuak move across the border frequently, in both directions, to visit relatives, trade, work, and flee insecurity. Pochalla County was a contested area during Sudan's long civil war, and many Sudanese refugees returned to South Sudan from the refugee camp at Pugnido, Ethiopia after the Comprehensive Peace Agreement was signed in January 2005. Clashes between Agnuak and Nuer hampered activities by the EDEP in Gog Woreda in the latter months of 2006 and sporadic insecurity from various causes has been a serious problem in the district for many years. Agnuaks in Pochalla are also known to visit areas of Pibor County, especially at the peak of the dry season in February-March, and according to Ethiopian authorities, members of another ethnic group in Pibor, the Murle, travel "frequently" to Gog Woreda to raid cattle.

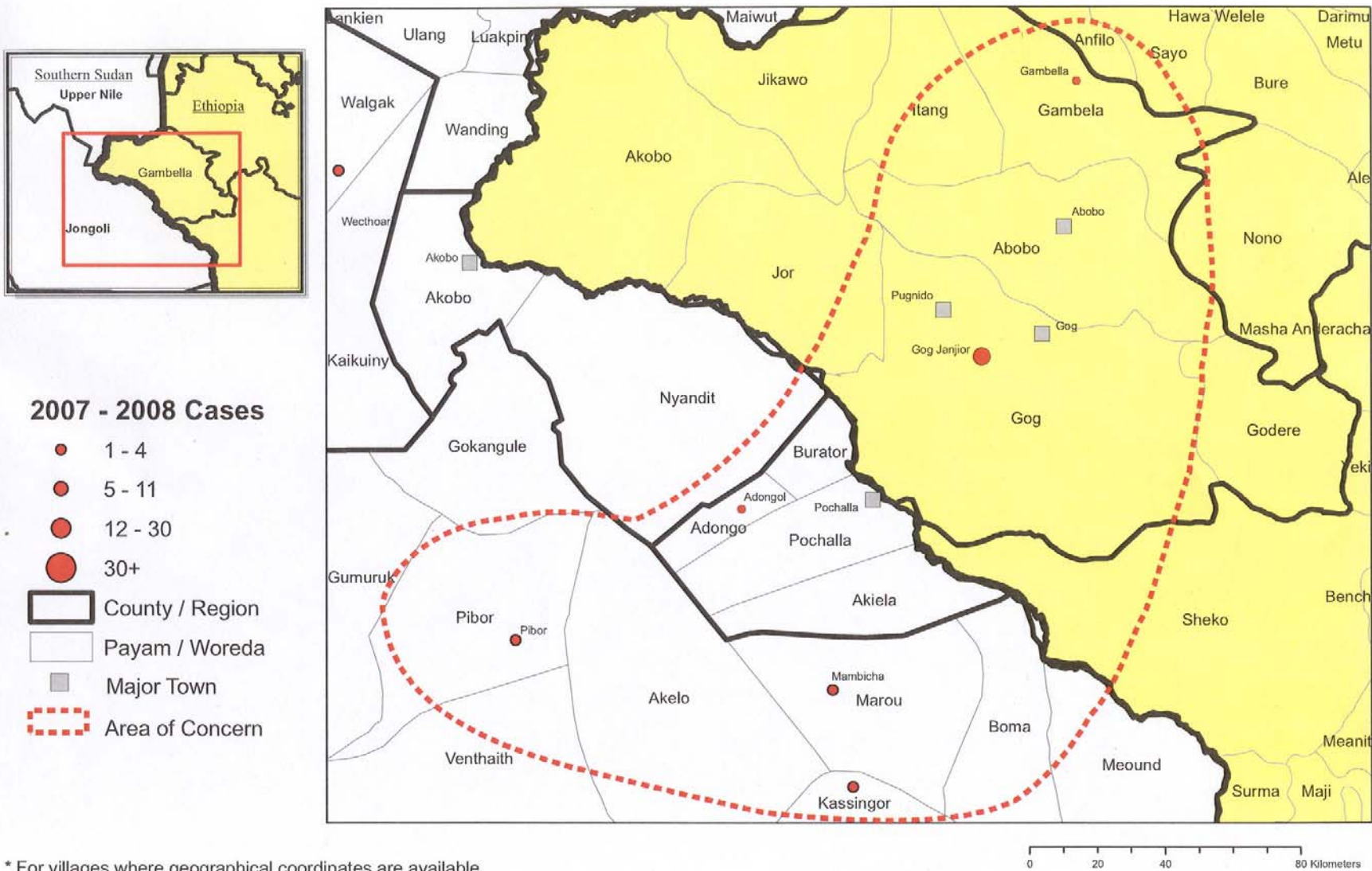
*Editorial Note: With a common ethnic group, sporadic insecurity, conditions well suited for dracunculiasis transmission on both sides of the international border, and frequent cross-border travel in both directions, it may never be possible to be certain about the source of each of these infections. There may have been multiple sources, potentially in either or both countries, although there are currently more opportunities for transmission of dracunculiasis in South Sudan, where dracunculiasis transmission typically begins earlier in the year and lasts longer than in Ethiopia. What is most important now, however, is to detect and contain any additional cases as soon as the worm appears, establish adequate surveillance in Gog Woreda and Pochalla County, and prevent re-establishment of endemic transmission in Gambella Region. Health authorities in Ethiopia and South Sudan are urged to focus on developing adequate surveillance in the affected areas and sharing relevant information quickly. The EDEP also needs to mobilize regional and national health and political authorities in Ethiopia, as well as its international partners, in order to address the serious epidemiological and security issues highlighted by this episode.*

# Border Region of Southern Sudan and Ethiopia

## Guinea Worm Eradication Program

### Cases of Guinea worm disease reported Jan 2007 - Mar 2008\*

Figure 1



\* For villages where geographical coordinates are available

Note: This map is provisional and is not an authority on boundaries or roads or exact locations. This map was created for the purpose of the Guinea Worm Eradication Program.

*Every experienced viewer of horror movies knows that one should never go back to see or poke at the monster or villain to make sure it is dead. In real life, our job as Dragon Slayers is exactly the opposite. We must always check to make sure the “little dragons” (Guinea worms) are dead and that they don’t reappear when we least expect it. DRH*

## **GHANA: CONTINUED REDUCTIONS, RESIDUAL CHALLENGES**

Ghana has reported 69 cases in April 2008, which is a reduction of -76% from the 293 cases reported in April 2007, and continues the Ghana GWEP’s recovery that began to be manifested in April 2007 (Figure 2). Ghana’s reductions in cases for January-April 2008 is an impressive – 89% (271 vs 2,508 cases). At least 77% of the cases in 2008 so far have been contained, with several cases still pending containment. Fully 30% of the cases reported through April have been contained in case containment centers (CCC), versus 17% of cases contained in CCCs in all of 2007. Twenty-six villages were endemic in January – March, while 42 villages reported only imported cases in the same period (Burkina Faso also reported one case imported from Ghana in April). Through April, there were no known endemic villages outside of the Northern Region in 2008. 54% of cases this year are in children 15 years old or younger. As of the end of March, all endemic villages have received health education, 96% had received pipe filters since January 2007, 70% had cloth filters in all households, 48% had water sources treated with ABATE® Larvicide, and 45% had at least one source of safe drinking water.

Small, but significant recent outbreaks in Yong village (15 cases) of Tamale District and in Sankpala (13) and Fulfoso (7) villages of Central Gonja District, however, point to pockets of residual weaknesses in supervision, surveillance and interventions that must be corrected in order to stop all transmission by 2009. Another dangerous on-going vulnerability is in the vast unguarded Guinea worm-free areas of the country. The program is refining its health education to focus on materials in Dagbani, and on methods for reaching children, both in and out of school. The next annual Program Review will be held in Tamale July 23-34.

*“Learn from past cases, manage the present cases, and prepare for future cases.” Phil Downs*

## **IN BRIEF**

**Mali** reported one case of dracunculiasis, in Gao District, in April. This case, which was contained, was traced to a nearby site that registered 16 cases, only four of which were contained, in 2007. Mali’s main transmission season is July-December. The program plans to use medical students to help intensify supervision in problem areas this year, and will emphasize hospitalization of cases that do occur. Unfortunately, increasing insecurity has resumed as a major problem in eastern Mali, where all missions to some endemic areas in Kidal, Ansongo, Gourma Rharous and Gao Districts have been suspended by the government recently, although the program has trained and supplied indigenous health workers in most of the areas of concern already.

**Sudan** has reported 361 cases in January – April 2008, with 74% of villages reporting. This is a reduction of 66% from the 1,049 cases that were reported during the same period of 2007 (Figure 3). Recent armed conflicts in Abyei and in northern Jonglei State are a great cause of concern.

Figure 2

**GHANA GUINEA WORM ERADICATION PROGRAM  
 CASES REPORTED DURING 2007-2008 VERSUS HIGHEST AND LOWEST NUMBER OF CASES  
 REPORTED DURING THE PRECEDING TEN YEARS (1997-2006)**

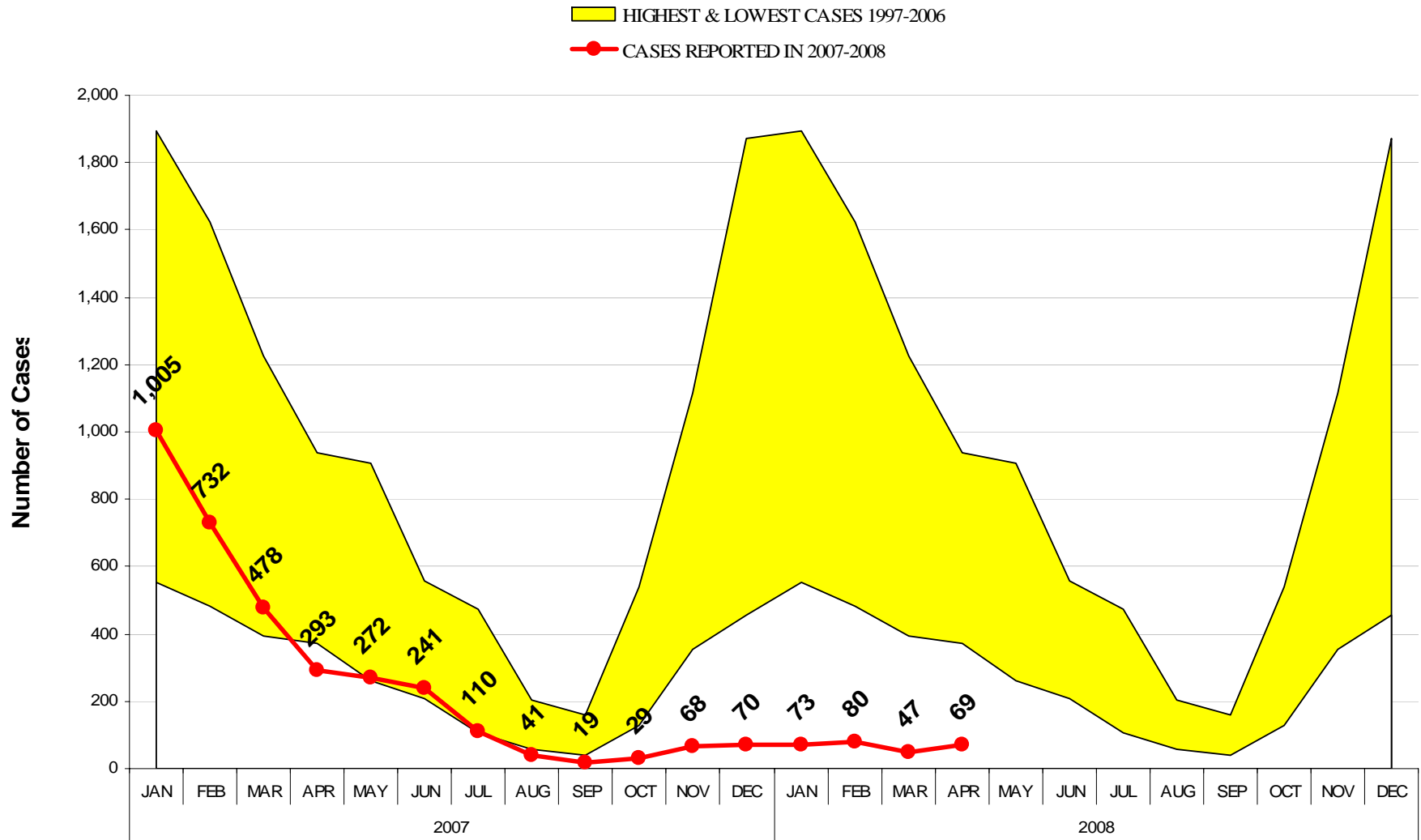
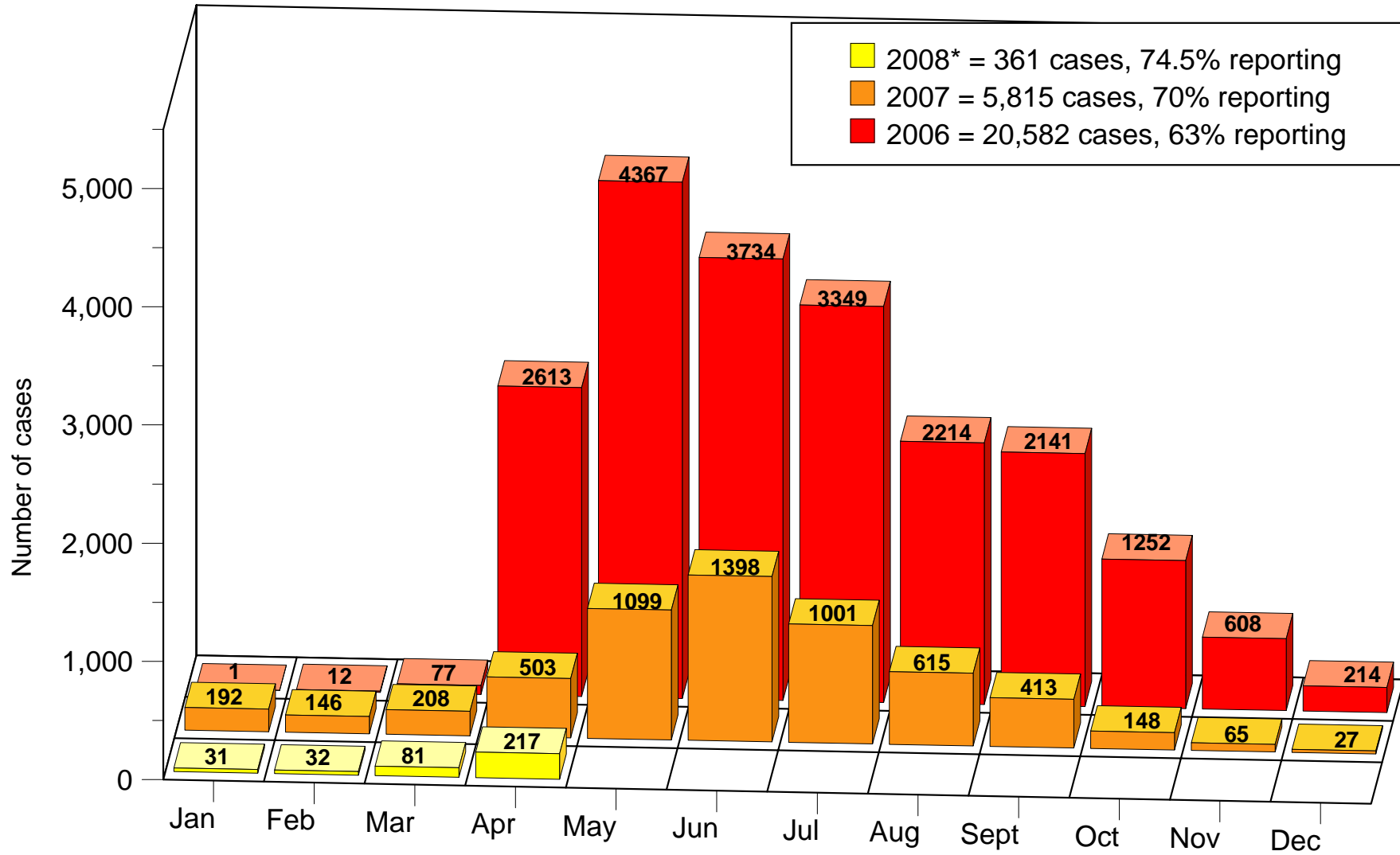


Figure 3

### SUDAN GUINEA WORM ERADICATION PROGRAM NUMBER OF REPORTED CASES OF DRACUNCULIASIS: 2006 - 2008\*



\*provisional





## **GENERAL GOWON VISITS ENUGU STATE, INAGURATES WELLS**

Former Nigerian Head of State General (Dr.) Yakubu Gowon made an advocacy and mobilization visit to Enugu State on April 28, accompanied by representatives of the Nigerian Federal Ministry of Health, The Carter Center, WHO, UNICEF and Sahara Energy Resources. The team paid courtesy calls on the governors of Enugu State and Ebonyi State before proceeding to Ezza Nkwubor village in Enugu East Local Government Area (LGA) of Enugu State. Ezza Nkwubor is the focus of the outbreak discovered belatedly in January 2007. It is the source of all 37 dracunculiasis cases reported so far this year, and is likely to be the site of the last case of dracunculiasis ever to occur in Nigeria. Sahara Energy Resources, an oil drilling company operating in the Niger Delta, provided eight borehole wells in Ezza Ogoumu, and 1 in Otamaze village. Ms Yu Kosuge, a Japanese pianist, donated \$8,000 to provide a third borehole well in Ezza Oguomu. General Gowon commissioned all nine borehole wells during his visit. Authorities in Enugu East LGA also donated four 1500 liter capacity storage tanks to help supply clean drinking water for Ezza Nkwubor village. Dr. Ngozi Njebuome, director of public health in the Federal Ministry of Health, led a separate fact finding mission of staff from the FMOH, WHO and Nigeria's Guinea Worm Eradication Program in a visit to Ezza Nkwubor village on April 12.

## **INFORMAL MEETING OF ENDEMIC COUNTRIES HELD DURING WORLD HEALTH ASSEMBLY**



The World Health Organization convened an Informal Meeting with Ministers of Health of Guinea worm affected countries on May 21 during the World Health Assembly in Geneva. This was the third in what has become an annual event to bolster commitment to eradicating dracunculiasis by the end of 2009. The WHO Regional Director for the Eastern Mediterranean, Dr. Hussein Abdel-Razzak Al-Gezairy, chaired the meeting. Also attending were the chairman of the International Commission for the Certification of Dracunculiasis Eradication, Dr. Abdul Rahman Al-Alwadi, and WHO assistant director-general Dr. Hiroki Nakatani. The current status of the eradication campaign and of the certification process was summarized by Dr. Ernesto Ruiz-Tiben of the Carter Center and by Dr. Gautam Biswas of WHO, respectively. All of the remaining endemic countries and several formerly endemic countries were represented at the two hour meeting, but unfortunately not by their ministers of health. During her address to this year's assembly, WHO director-general Dr. Margaret Chan reminded the audience that "...we are on the brink of eradicating guinea-worm disease, and funds are being secured to ensure this happens."

## **STOPPING TRANSMISSION OF GUINEA WORM ERADICATION BY 2009**

The impact of interventions against transmission of GWD during 2006 and 2007 continued during January-April 2008: only 669 indigenous cases of GWD were reported, an 81% reduction in cases from the 3,603 cases reported during the same period in 2007 (Table 1 and Figure 5). The significant trends in reductions in cases of GWD during the last two years and during January – April 2008 are also depicted in Figure 6, which compares the cumulative number of cases by month during 2006, 2007 and so far during 2008. While these trends are very encouraging, Sudan, Ghana and Mali which aim to stop transmission by 2009, so that zero cases are reported during 2010, have a daunting task ahead. The experience of all 15 formerly endemic countries when they reached about 100 cases of the disease indicates that all required at least 3 or more years to reduce cases from about 100 to zero. (Table 2). There is no reason why 3 or more years are required, but in order to break the 3 year plus



Table 1

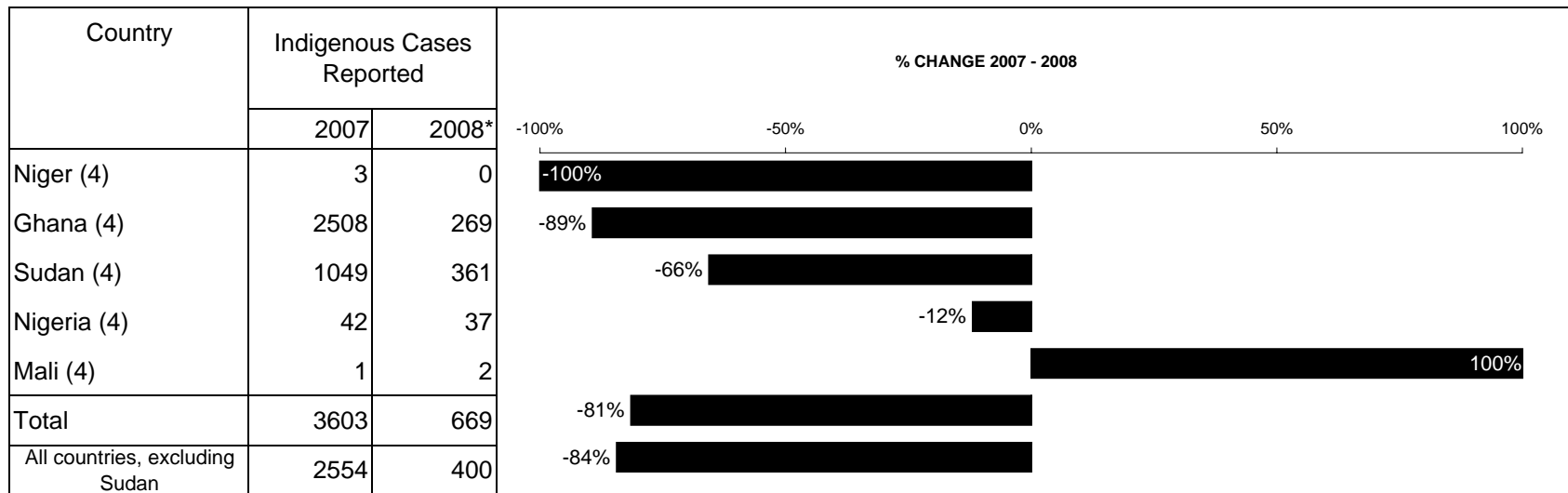
**Number of Cases Contained and Number Reported by Month during 2008\***  
(Countries arranged in descending order of cases in 2007)

COUNTRIES REPORTING CASES	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED													% CONT.
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL*	
SUDAN	4 / 31	7 / 32	22 / 81	44 / 217	/	/	/	/	/	/	/	/	77 / 361	
GHANA	67 / 73	64 / 80	39 / 47	47 / 69	/	/	/	/	/	/	/	/	217 / 269	81
MALI	1 / 1	0 / 0	0 / 0	1 / 1	/	/	/	/	/	/	/	/	2 / 2	100
NIGERIA	28 / 28	8 / 8	1 / 1	0 / 0	/	/	/	/	/	/	/	/	37 / 37	100
NIGER	0 / 0	1 / 1	0 / 0	0 / 0	/	/	/	/	/	/	/	/	1 / 1	100
ETHIOPIA	0 / 0	0 / 0	2 / 2	20 / 25	/	/	/	/	/	/	/	/	22 / 27	81
BURKINA FASO	0 / 0	0 / 0	0 / 0	1 / 1	/	/	/	/	/	/	/	/	1 / 1	100
TOTAL*	100 / 133	80 / 121	64 / 131	113 / 313	/	/	/	/	/	/	/	/	357 / 698	51
% CONTAINED	75	66	49	36									51	
% CONT. OUTSIDE SUDAN	94	82	84	72									83	

\* provisional

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

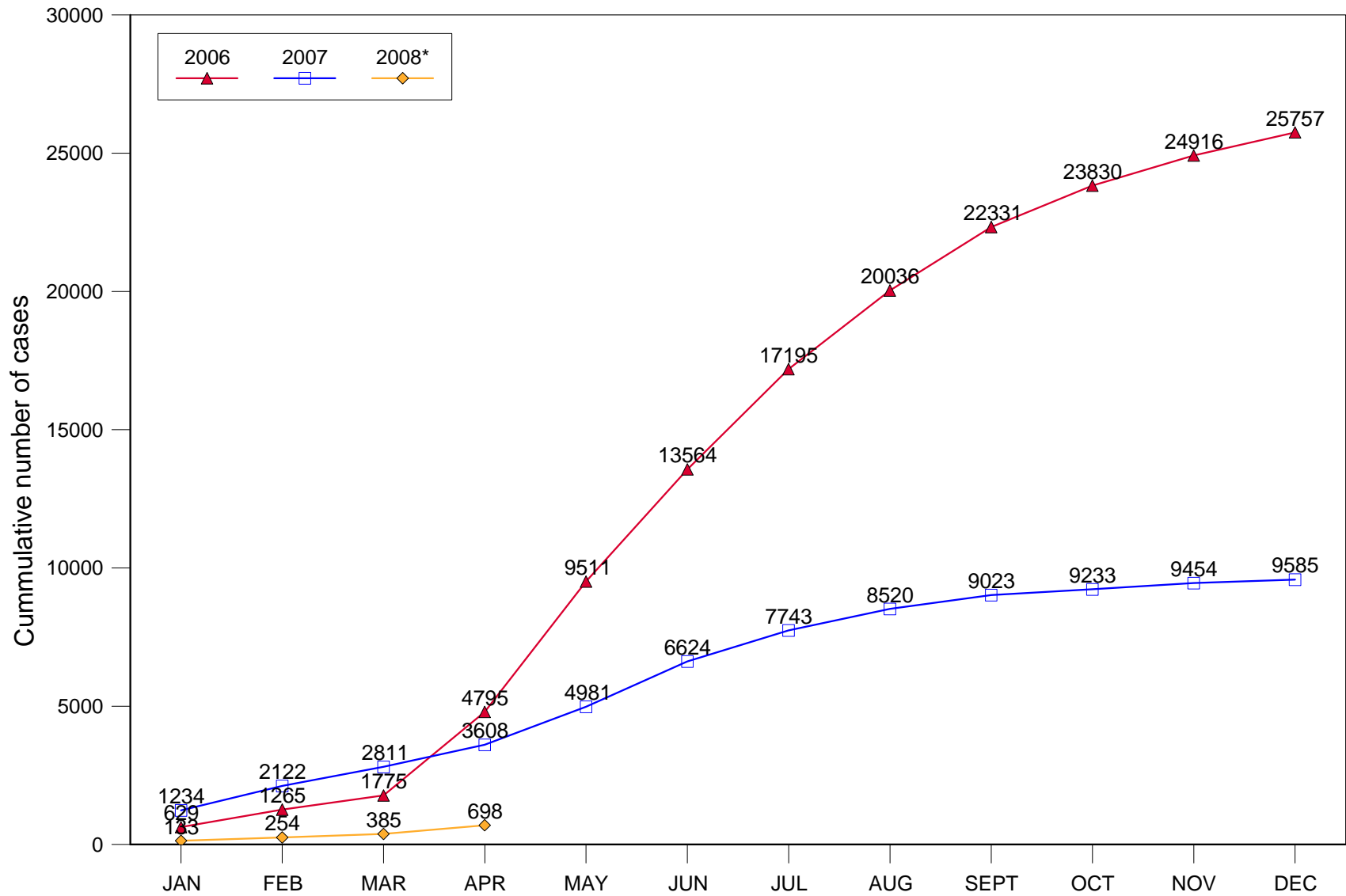
Figure 5  
 Number of Indigenous Cases Reported During the Specified Period in 2007 and 2008\*, and Percent Change in Cases Reported



\* Provisional: excludes cases exported from one country to another  
 (4) Indicates months for which reports were received, i.e., Jan.-Apr. 2008

Figure 6

### Cumulative Number of Cases of Dracunculiasis Reported Monthly During 2006 - 2008\*



\* Provisional

trend the remaining endemic countries must detect every person with GWD and immediately act to stop transmission. Any lapses in the immediate detection of cases and in their containment will likely result in additional years of work to stop transmission. Hence, our very first statement in this issue about the provisional number of uncontained cases of dracunculiasis outside of Sudan so far in 2008: 60 in Ghana; 5 in Ethiopia, Zero in Mali, Nigeria, and Niger, as each uncontained case represents an opportunity for transmission of GWD to continue.

Table 2

Indigenous Cases Reported by Country and Year, from About 100 Cases to Zero Cases, and Number of Years Required to Stop Transmission of Guinea Worm Disease.																		Number of Years to stop transmission of GWD.
Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Pakistan	106	23	2	0	0	0												3
Kenya		35	35	37	0	0	0											3
India				371	60	9	0	0	0									3
Yemen				106	82	62	7	0	0	0								4
Cameroon		127	72	22	9	9	1	0	0	0								6
Senegal				195	76	19	4	0	0	0								4
Chad						127	25	3	0	0	0							3
CAR						9	5	34	26	33	36	0	0	0				6
Uganda										92	51	6	13	0	0	0		4
Benin											172	181	30	3	0	0	0	4
Mauritania											94	42	13	3	0	0	0	4
Cote d'Ivoire												192	42	20	9	5	0	5
Ethiopia										54	10	24	13	3	29	1	0	7
Burkina Faso													175	35	20	3	0	4
Togo														232	70	25	0	3
Currently Endemic Countries																		
Nigeria															120	16	73	
Niger															175	108	11	
Mali																		313
Ghana																		3,358
Sudan																		5,815

5 Indicates year last indigenous case reported.

### GWEP WORK FORCE: CATEGORY AND GENDER BY COUNTRY DURING 2007.

Table 3 provides numbers by staff category and gender participating in the national GWEPs in Ghana, Mali, Nigeria, and Niger. All countries were asked to provide these data during the 8<sup>th</sup> African Conference on Dracunculiasis Eradication held in Abuja, Nigeria during April 2008. We hope that Sudan will provide similar figures for 2008.

Table 3

#### Guinea Worm Eradication Campaign Guinea Worm Eradication Program staff: Ghana, Mali, Nigeria, and Niger by Category and Gender

Staff Category	Ghana		Mali		Nigeria		Niger		All Countries			% by Staff Category
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total	
Volunteers	10,114	9,818	697	152	747	28	261	100	11,819	10,098	21,917	98%
Supervisors	154	24	39	0	109	18	35	1	337	43	380	2%
Other	NA	NA	46	2	NA	NA	19	3	5	65	70	0%
Sub-Total	10,268	9,842	782	154	856	46	315	104	12,221	10,146	22,367	100%
Total	20,110		936		902		419		22,367			
% by Gender	51%	49%	84%	16%	95%	5%	75%	25%	55%	45%		

## RECENT PUBLICATIONS

Bristol N, 2008. Profile Donald R Hopkins: eradicating Guinea worm disease. The Lancet 371:1571 (May 10).

World Health Organization, 2008. Dracunculiasis eradication: Global surveillance summary, 2007. Wkly Epidemiol Rec 83:159-167.

*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>.*



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