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

DEPARTMENT OF HEALTH & HUMAN SERVICES

Date: January 12, 2010

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

Subject: GUINEA WORM WRAP-UP #194

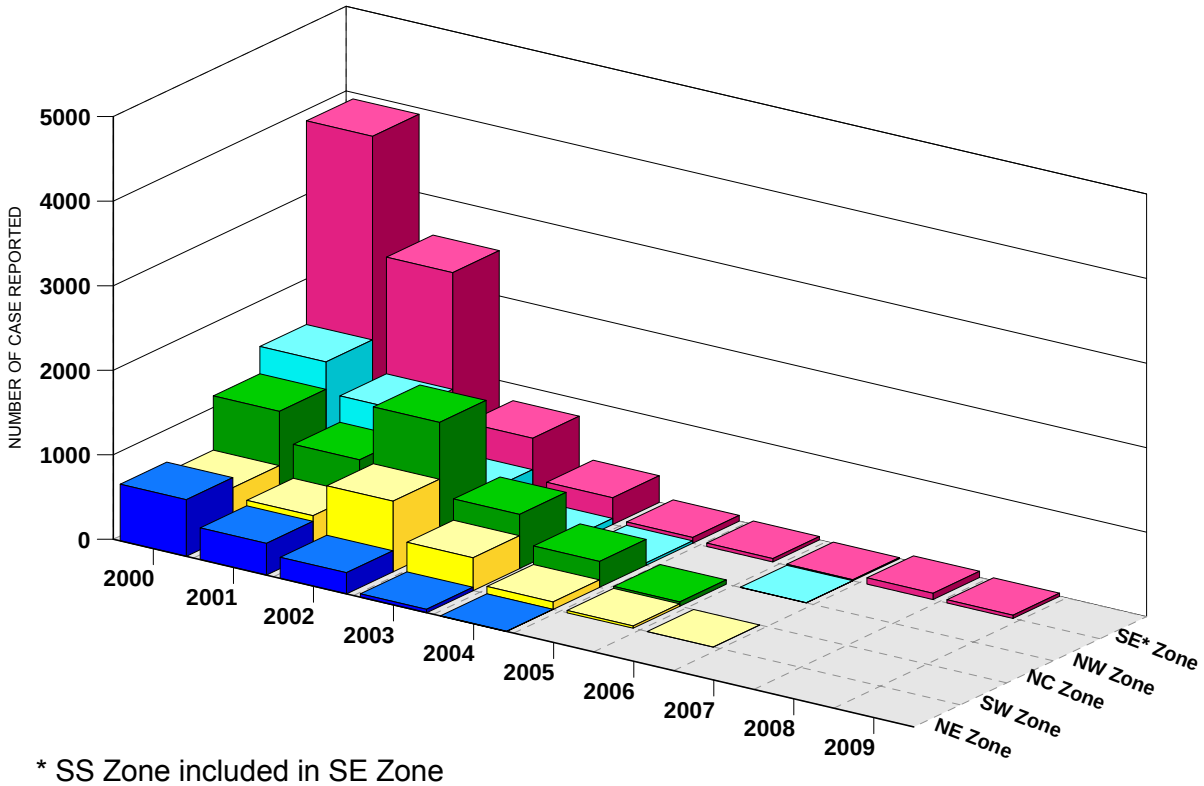
To: Addressees

NIGERIA WON: GUINEA WORMS ZERO

At the end of December 2009, Nigeria completed thirteen consecutive months with ZERO indigenous cases of dracunculiasis (guinea worm disease), thus having stopped transmission of the terrible disease after centuries and generations of untold suffering. Once home to more cases of dracunculiasis than any other country in the world, having enumerated 653,620 cases in 5,879 villages in 1988/89, Nigeria now celebrates this mighty triumph as the country also prepares to mark the Golden Jubilee of its political independence on October 1, 2010 (Figure 1). The final Nigerian patient was a 65 year-old woman in Ezza Nkwubor village of Enugu East Local Government Area of Enugu State whose worm emerged at a Case Containment Center on November 11, 2008. Her village experienced a surprise outbreak that was discovered in 2006 and continued into 2007 before being extinguished in November 2008.

Figure 1

Nigeria Guinea Worm Eradication Program
Distribution of Cases of Dracunculiasis by year and Zone*: 2000 - 2009



* SS Zone included in SE Zone

We join in congratulating the Government and People of Nigeria, current and past members of the Nigerian Guinea Worm Eradication Program (NIGEP), numerous donors, thousands of village volunteers and other health workers, and especially former Nigerian head of state General (Dr.) Yakubu Gowon, who made 82 visits to 18 states and 135 endemic Nigerian communities between 1999 and 2009 as chief advocate for NIGEP, with assistance over the past decade by Carter Center Country Representative Dr. Emmanuel Miri, and more recently by Mr. Adamu Keana Sallau, who supervised efforts in the Southeast Zone after the last outbreak was detected.

Since its inception, NIGEP benefited from early technical assistance by the Centers for Disease Control and Prevention (CDC) and early financial assistance by the UNICEF mission to Nigeria; sustained technical and financial assistance by The Carter Center; major in-kind donations by American Cyanamid/American Home Products/BASF (ABATE@Larvicide), DuPont Corporation and Precision Fabrics Group (nylon filter material), and the Government of Japan (vehicles, motorbikes) through the Carter Center; and major water supply project assistance by UNICEF and the Government of Japan; with substantial funding in later years by the Bill & Melinda Gates Foundation through The Carter Center. The Government of Nigeria itself provided early leadership in its Federal Minister of Health, the late Prof. Olikoye Ransome-Kuti, and by donating two million dollars to The Carter Center for the Nigerian Guinea Worm Eradication Program. NIGEP has had three National Program Coordinators: Dr. Lola Sadiq, the late Dr. K.A. Ojodu, and presently Mrs. Ifeoma Anagbogu. Nigeria's National Certification Committee on Guinea Worm Disease Eradication, which was established in May 2005, has requested the World Health Organization to conduct an independent external evaluation of the program on February 1-15, 2010, to inaugurate Nigeria's entry into the final pre-certification phase of the campaign.

"…The elders also told of how the loudness of each aircraft's sonic boom [signifying national elimination of the disease] *was proportional to the numbers of cases of dracunculiasis that the country had at the beginning of the campaign. So that when Nigeria broke the sound barrier, the reverberating sound shook the earth all over Africa."* From "The Boom Boom Game", Guinea Worm Wrap-Up #48, May 1, 1995.

!!Detect and Report Every Case, Contain Every Worm!!

STATUS OF 2009 GOALS

A year ago, in Guinea Worm Wrap-Up #186 (January 12, 2009), we set forth several suggested goals for national Guinea Worm Eradication Programs in 2009, including the overall goal to contain EVERY CASE of the disease during 2009. At the end of 2008, there remained a total of six endemic countries and 1,983 uncontained cases (43% of all cases reported) for that year. We did not contain every case in 2009, but we ended the year with a provisional total of 516 uncontained cases (16% of all cases reported) and only four endemic countries remaining:

Table 1

Uncontained cases in 2008		**Uncontained cases in 2009 (thru Nov)**	
Sudan	1837	Sudan	441
Ghana	73	Ghana	17
Mali	63	Mali	51
Ethiopia	9	Ethiopia	1
Niger	1	Niger	3 (imported)
Nigeria	0	Nigeria	0

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*	CONT.
SUDAN	4/12	12/18	37/47	172/223	293/431	423/461	456/523	480/549	257/284	112/142	/	/	2246/2690	83
GHANA	40/45	49/50	50/52	27/28	30/34	18/19	6/7	1/1	1/1	2/3	0/0	1/2	225/242	93
MALI	0/0	0/0	0/0	0/0	1/1	7/7	14/23	34/43	48/68	23/34	5/7	3/3	135/186	73
ETHIOPIA	0/0	0/0	1/1	7/7	5/5	7/8	2/2	1/1	0/0	0/0	0/0	0/0	23/24	96
NIGERIA	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
NIGER	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0	1/2	0/1	1/1	0/0	2/5	40
TOTAL*	44/57	61/68	88/101	206/258	329/471	455/495	478/555	516/594	307/355	137/180	6/8	4/5	2631/3147	84
% CONTAINED	77	90	87	80	70	92	86	87	86	76	75	80	84	
% CONT. OUTSIDE SUDAN	89	98	94	97	90	94	69	80	70	66	75	80	84	

* provisional

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

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													%
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL*	CONT.
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	49
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	85
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	85
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	100
NIGER	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0	1/1	0/1	0/0	0/0	2/3	67
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	78
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	100
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	57
% 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	

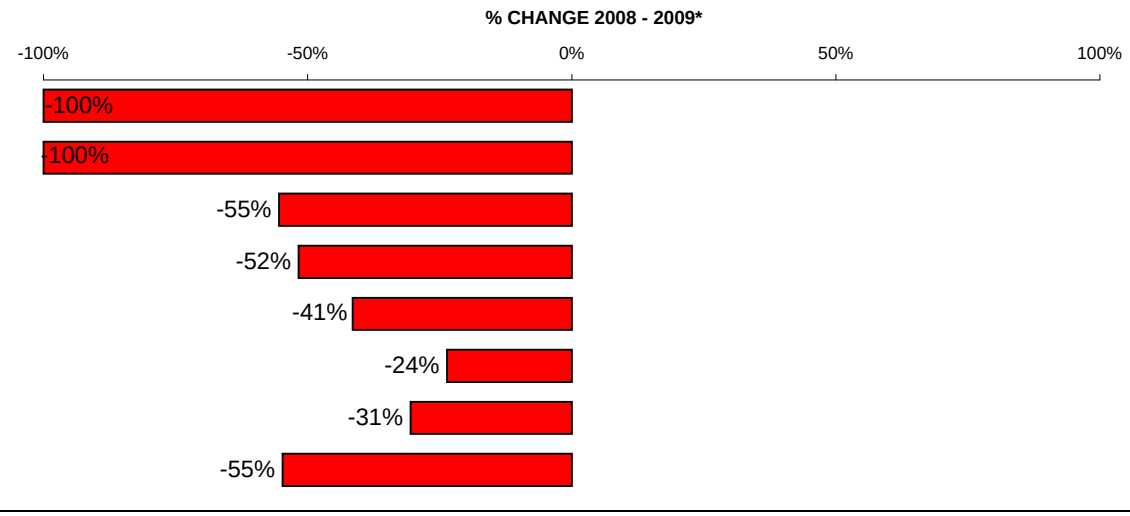
* Includes 6 cases of GWS exported from one country to another.

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 2008 and 2009*, and Percent Change in Cases Reported

Country	Indigenous Cases Reported	
	2008	2009*
Nigeria (12)	38	0
Niger (12)	2	0
Mali (12)	417	186
Ghana (12)	501	242
Ethiopia (12)	41	24
Sudan (10)	3522	2690
Total	4521	3142
All countries, excluding Sudan	999	452



* Provisional: excludes cases exported from one country to another
(12) Indicates months for which reports were received, i.e., Jan. - Dec. 2009

How did we do regarding the suggested priority issues in each country during 2009?

Sudan. *We highlighted the need to increase the case containment rate (improved from 49% in 2008 to 83% in 2009), and we hoped for "minimal insecurity in endemic areas" (insecurity incidents increased in 2009).*

Ghana. *We highlighted the need to detect, contain and explain the source of every case within 24 hours (detected and contained 93% of cases; explained nearly all).*

Mali. *We highlighted the need to detect, contain and explain every case of Guinea worm disease within 24 hours and hoped that insecurity wouldn't hinder operations during 2009 (72% containment rate in 2009 vs. 85% in 2008; insecurity did hinder some operations in Kidal and Gao Regions in 2009).*

Nigeria. *We noted that Nigeria appeared to have detected, contained and explained every case in 2008 (zero cases in 2009).*

Ethiopia*. We highlighted the need to detect and contain every case in Gambella Region in 2009 and to work constructively with the South Sudan Guinea Worm Eradication Program to ascertain the sources of any suspected imported cases (contained all but one indigenous case, and there has been no known imported case into Ethiopia in 2009).*

Niger. *We stressed the need to be alert for any additional indigenous cases and for any possibly imported cases (there has been no known indigenous case in 2009; Niger has officially contained only 2 of the 5 cases imported in 2009).*

SOUTHERN SUDAN: ANNUAL PROGRAM REVIEW, FEWER FOCAL AREAS

The Southern Sudan Guinea Worm Eradication Program (SSGWEP) convened its 4th Annual Program Review at the Juba Hotel in Juba, Sudan on 8-9 December 2009. In his summary of provisional data presented at the meeting, the director of the program, Mr. Makoy Samuel Yibi, reported that after almost four years of interventions by the SSGWEP, only three of the original four focal areas now remain: Greater Tonj (Warrap State), Central Equatoria / Lakes, and Greater Kapoeta (Eastern Equatoria State) (Figure 4, Table 5). The SSGWEP reported a provisional total of 2,690 cases of dracunculiasis in January - October 2009, of which 87% occurred in only three of Southern Sudan's ten states (Warrap, Eastern Equatoria and Lakes), and when Central Equatoria is added, 97% of cases occurred in four states (Table 3). These four states recorded provisional changes in number of cases between January-October 2009 and the same period of 2008 of 2%, -50%, -8% and -16% respectively. Overall, the SSGWEP reported -24% fewer cases than were reported during January-October 2009, compared to a reduction in cases of -38% between 2007 and 2008, and -72% between 2006 and 2007. Overall, 54% of cases reported in 2009 were females (1,164).

Table 3

Southern Sudan Guinea Worm Eradication Program
Number of Dracunculiasis Cases by Month by State 2009, and Total Number of 1+ villages and 5+ Villages by state, as of October 2009*

State	1+ Villages	5+ Vllages	J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
Warrab			1	4	9	47	79	196	290	316	150	74			1166
Eastern Equatoria			0	3	11	125	215	124	83	73	39	5			678
Lakes			1	0	4	11	95	85	100	119	52	27			494
Central Equatoria			5	9	23	35	35	53	34	27	28	16			265
Western Bahr Al Ghazal			4	2	0	5	8	4	10	11	7	7			58
Western Equatoria			0	0	0	1	2	2	6	2	2	1			16
Jonglei			1	0	0	0	0	0	1	2	3	0			7
Northern Bahr Al Ghazal			0	0	0	0	1	0	0	0	0	5			6
Unity															0
Upper Nile															0
TOTAL	982	124	12	18	47	224	435	464	524	550	281	135	0	0	2690

*** provisional**

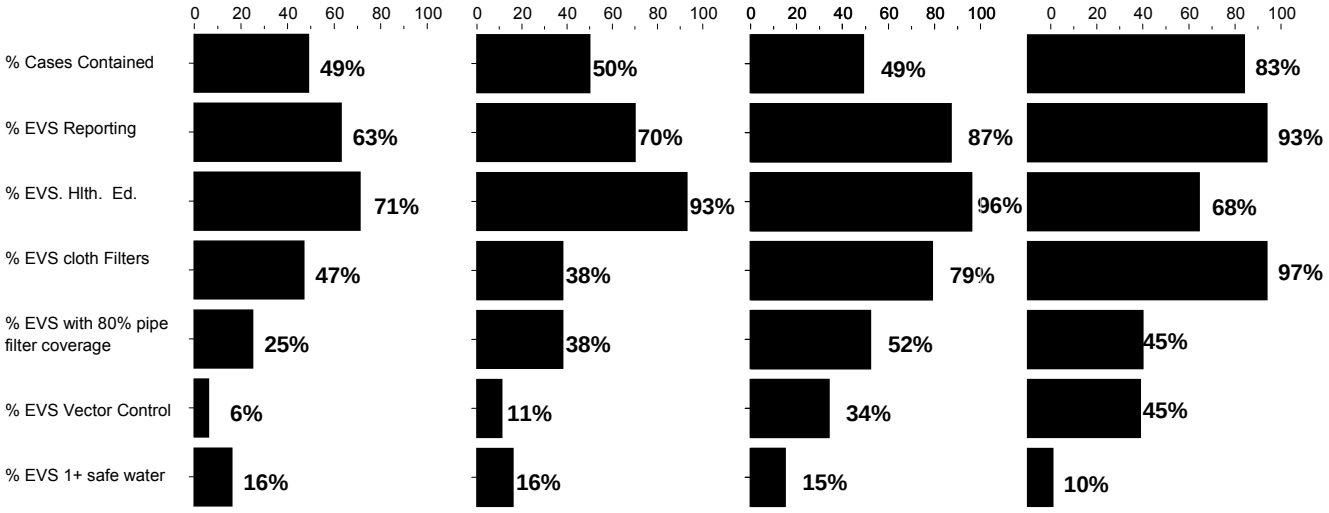
A total of 982 villages reported 1 or more cases in January-October 2009 (of which 579 villages reported indigenous cases and 403 villages reported only imported cases), including only 124 villages that reported 5 or more cases each. However, nearly one-half (1,319 or 49%) of cases reported so far in 2009 were in villages that had no known cases in 2008, either because their village reported zero cases (1,000 cases) that year, or because their village submitted no surveillance reports at all in 2008 (319 cases). This anomaly is due partly to increased insecurity in Southern Sudan during 2009 (32 incidents affected payams that reported 2,222 cases in 2008), as well as increased movement of people to and within cattle camps because of drought conditions, both of which are associated with increases in cases imported into non-endemic villages.

The SSGWEP has steadily improved the coverage of interventions over the past four years, as illustrated in Figure 3, although coverage of endemic villages with safe water supply (for which the program is not responsible) has not changed significantly. Most notably, the case containment rate rose from 49% in 2008 to 83% so far in 2009, and the percentage of endemic villages where ABATE© Larvicide was used increased from 34% to 45%, while the percentage of endemic villages where all households had a cloth filter increased from 79% to 97% (the low rate of heath education coverage in 2009 is attributed to incomplete data entry). The status of surveillance and interventions during 2009 is summarized in Table 4.

Figure 3

Southern Sudan Guinea Worm Eradication Program
Status Of Indicators In Endemic Villages (Evs) During 2006 - 2009*

Year	2006	2007	2008	2009*
Villages reporting indigenous cases	3,137	1,765	947	550
No of endemic villages	3,137	3,023	2,301	1,257
No. of cases	20,582	5,815	3,618	2508



*Provisional (January - September 2009)

Although the South Sudan water supply authorities and their partners at the previous annual review in December 2008 stated a goal to drill 200 new borehole wells in the top endemic localities during 2009, the Ministry of Water Resources and Irrigation (MWRI) reported achievement of only 36 new safe water sources and rehabilitation of 75 existing water points in endemic villages in Eastern Equatoria, Central

Equatoria, Warrap and Bahr Al-Ghazal States in January-October 2009. Nine of those new wells were placed in Kapoeta South County, where the percentage of endemic villages with access to one or more safe water sources increased from 15% in 2008 to 24% in 2009. At the December 2009 Review, the MWRI stated its intention to provide 115 safe water sources and rehabilitate 150 others in Guinea worm-endemic villages during 2010, with the assistance of UNICEF and PACT (an NGO), in an attempt to cover at least 50% of currently endemic villages. The SSGWEP's target is 100% for all other interventions during 2010.

The program admitted 12% (324) of all cases reported in 2009 to one of three Case Containment Centers (CCC) that were established in 2009 in Kapoeta North, South and East Counties, but only 211 (8%) of all cases were contained in a CCC (some were admitted but not contained successfully because they were not discovered within 24 hours or otherwise did not meet the criteria for case containment). One of the patients had a total of 30 worms removed. The CCC in Kapoeta East will be closed in 2010, and a new center established in Tonj North County of Warrap State, which was the highest endemic county in Southern Sudan in 2009, and reported 702 cases (26%) of Sudan's 2,690 cases. The SSGWEP also will distribute pipe filters house to house in 2010, aim to conduct spot checks for copepods in 80% of endemic villages targeted for ABATE treatments each month, and conduct intensive mobilizations known as Worm Weeks in each of the highest endemic bomas (districts).

As of January 1, 2010, the SSGWEP expects to re-classify the 10,544 villages (VAS) where it conducted active surveillance during 2009, as follows: 1,279 current endemic villages (had cases in 2008-2009), 3,023 formerly endemic villages (at-risk), and 6,242 "all other" villages. The SSGWEP will conduct active surveillance in the 4,302 villages in the first two categories, with primary external assistance provided by the Carter Center, while the Southern Sudan Ministry of Health will work to establish or continue passive surveillance in the other villages and Guinea worm-free areas, beginning in 13 priority counties, integrated into the nascent Integrated Disease Surveillance and Response (IDSR) network, with assistance provided by WHO. Priority for provision of safe water supply will be focused on villages in the currently endemic group. In 2009, Sudanese authorities registered 863 rumors of Guinea Worm disease, and investigated 852 of them, of which 22 were confirmed as cases of dracunculiasis. On 18-19 November 2009, the SSGWEP hosted a cross border meeting in Juba of program managers for the Guinea Worm Eradication Programs of Ethiopia, Kenya, the Northern States of Sudan and Uganda. Dr. Ernesto Ruiz-Tiben and Mr. Craig Withers of The Carter Center and Dr. Gautam Biswas of WHO headquarters participated in the Program Review of the SSGWEP.

As Sudan prepares to conduct national elections in April 2010 and hold a referendum in January 2011 on the future status of Southern Sudan, the SSGWEP needs to urgently 1) improve the quality, coverage and effectiveness of interventions in endemic villages, and 2) advocate for the South Sudan Ministry of Health and other partners to implement sensitive surveillance in all Guinea worm-free areas and bring safe water sources to bear in as many currently endemic villages as possible during 2010.

Table 4

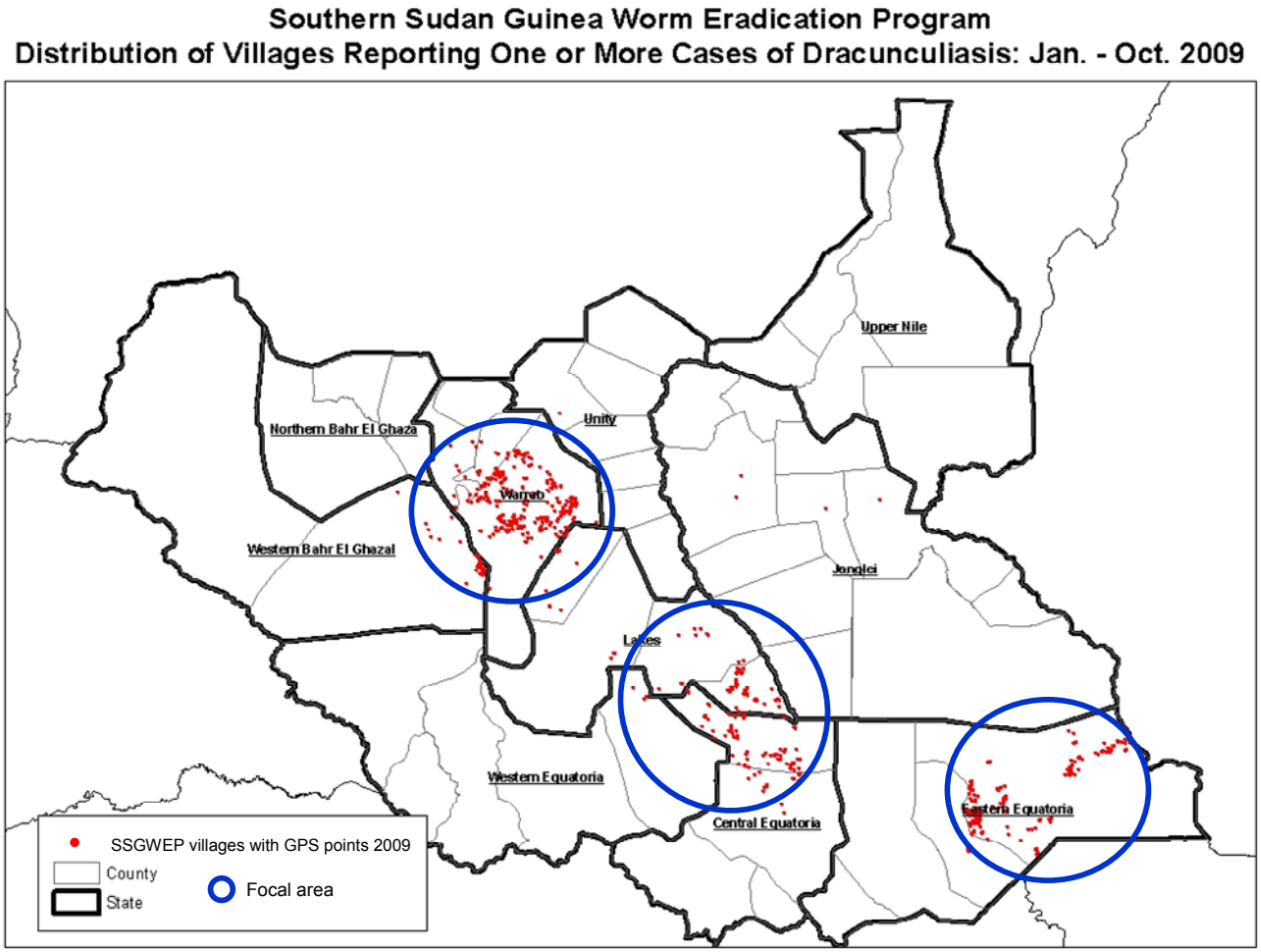
SOUTHERN SUDAN GUINEA WORM ERADICATION PROGRAM

PARAMETERS OF VILLAGES UNDER ACTIVE SURVEILLANCE AND OF ENDEMIC VILLAGES BY STATE: JANUARY - OCTOBER 2009*

States	Villages Under Active Surveillance (VAS)									Endemic Villages (EVS)								
	Cases Reported	Cases Contained	% Cont.	Number of Villages	% Reporting	Imported Cases Reported	% Imported	Number of imported cases detected in VAS only	% of total cases reported that were imported and detected in VAS only	Cases Reported	Cases Contained	% Cont.	% of total cases reported detected in EVS	Number of Villages	% Reporting	Imported Cases Reported	% Imported	% of total cases reported that were imported and detected in EVS only
Warrab State	1,166	1,011	87%	5,119	93%	394	34%	281	24%	885	785	89%	76%	555	94%	113	13%	10%
Eastern Equatoria State	678	561	83%	2,179	95%	165	24%	102	15%	576	487	85%	85%	385	96%	63	11%	9%
Lakes State	494	409	83%	1,710	72%	72	15%	33	7%	461	389	84%	93%	165	88%	39	8%	8%
Central Equatoria State	265	203	77%	432	94%	79	30%	60	23%	198	163	82%	75%	76	98%	19	10%	7%
Western Bahr Al Ghazal	58	43	74%	567	78%	24	41%	14	24%	44	34	77%	76%	56	89%	10	23%	17%
Western Equatoria State	16	14	88%	20	35%	11	69%	10	63%	6	5	83%	38%	4	83%	1	17%	6%
Jonglei	7	5	71%	505	61%	2	29%	2	29%	5	4	80%	71%	31	97%	0	0%	0%
Northern Bahr Al Ghazal	6	0	0%	6	78%	0	0%	0	0%	6	0	0%	100%	7	24%	0	0%	0%
Total	2,690	2,246	83%	10,538	88%	747	28%	502	19%	2,181	1,867	86%	81%	1,279	93%	245	11%	9%

*** provisional**

Figure 4



* Represents 78% of 2,690 cases provisionally reported during January – October 2009

Table 5

Southern Sudan Guinea Worm Eradication Program
Three Focal Areas (January - October 2009)

Parameter	Greater Kapota Eastern Equatoria	Warrap Greater Tonj	Central Equatoria Lakes
Cases (% of Sudan's total)	678 (25%)	1166 (49%)	759 (28%)
Number of endemic villages needing urgent water sources before April 2010	21	43	32
Total number of endemic villages in 2009	365	555	120
% cases 0 - 15 years	49%	50%	39%
% females	60%	50%	89%
Main ethnicity	Toposa	Dinka	Barl, Dinka, Mandari
% case containment	83%	87%	79%
Coverage of endemic villages			
- Reporting monthly	90%	93%	83%
-Providing health education	95%	98%	90%
- with cloth filters in 100% households	99%	98%	98%
- with pipe filters distributed to 100% of eligible population	52%	43%	50%
- protected with ABATE ® Larvicide	72%	14%	48%
- with 1+ safe sources of drinking water	18%	9%	20%

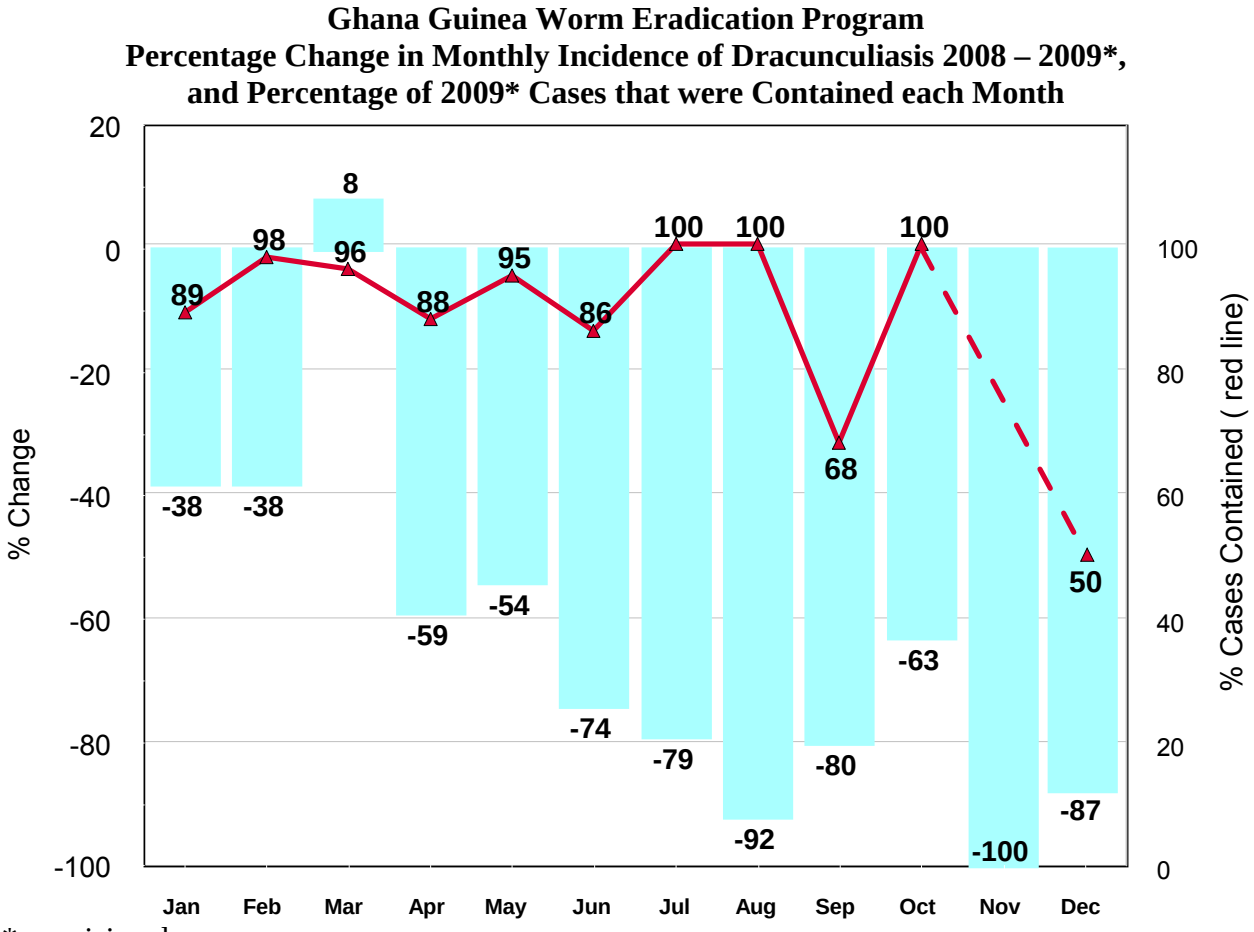
GHANA ACHIEVES ITS FIRST ZERO CASE MONTH NATIONWIDE!

For the first time since Ghana's Guinea Worm Eradication Program (GGWEP) began in 1988, in November 2009 Ghana achieved the momentous milestone of an entire month with zero cases of dracunculiasis reported anywhere in the country. This first zero case month came at the end of four months (August-November), including the beginning of the 2009-2010 peak transmission season, when Ghana reported a total of only 5 cases of the disease, compared to 40 cases reported during the same period in 2008 (Figure 5). Only 5 cases were reported outside of the Northern Region in January-November 2009, of which 4 cases were imported from the Northern Region: two each in Brong Ahafo Region and Ashanti Region.

Meanwhile, the GGWEP continues to tighten containment around remaining cases and shrink the number of villages with cases, as shown in Table 6.

Radio spots with messages about preventing Guinea worm disease are being broadcast during November 15, 2009 – May 15, 2010. A team of five Members of Parliament from the Parliamentary Sub-Committee on Guinea Worm in Northern Region visited Fulfuso Junction and Central Gonja District on November 4-5, 2009. On December 1-3, 2009 the National Disease Surveillance Unit of the Ghana Health Service and staff of the GGWEP met in Kumasi to discuss preparations for certification and for establishing and sustaining surveillance in Guinea worm-free areas of Ghana, with the assistance of WHO. Representatives of all ten regions of the country participated.

Figure 5



* provisional

Table 6

Ghana Guinea Worm Eradication Program

	2008	**2009***
# villages with 1+ cases	131	52
# villages with indigenous cases	46	19
% cases contained	85%	93%
% cases contained in a case containment center	37%	75%
% EV with cloth filters in all households	75%	93%
% EV with pipe filters	74%	90%
% EV protected with ABATE	58%	86%
% EV with one or more sources of safe drinking water	46%	71%
% EV with health education about dracunculiasis	100%	100%

* provisional

Simply put, the task of the GGWEP now is to <u>detect</u> and <u>contain</u> within 24 hours, and <u>explain the source</u> of EVERY case of dracunculiasis that occurs in Ghana in 2010. It appears that Ghana now has the zeal at all levels to stop transmission of dracunculiasis.

ETHIOPIA

Ethiopia has begun preparing intensive measures to stop transmission of dracunculiasis in the country during 2010. All 24 cases reported during 2009 were from Gambella Region, where 22 of the cases were reported from Gog Woreda (District), and 1 case each from Abobo and Itang Woredas. Beginning in January 2010, the program will place <u>all</u> villages of Gog Woreda under active surveillance. The geographic coordinates of all those villages have been recorded in order to map and categorize each village in the district by level of risk. The village location and month of occurrence of the cases in 2009 are shown in Table 7. Additional supplies and transport have been ordered and The Carter Center will provide a temporary technical assistant to help implement active surveillance and interventions in the district.

Table 7

NUMBER OF CASES CONTAINED AND NUMBER REPORTED BY MONTH FROM VILLAGES IN ETHIIOPIA REPORTING CASES DURING 2009*
(VILLAGES ARRANGED IN DESCENDING ORDER MONTH WHEN FIRST CASE OCCURRED IN 2009)

VILLAGES REPORTING CASES (WOREDA)	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED													% Cont.
	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL*	
AGENGA / PUGNIDO (GOG)	0/0	0/0	1/1	3/3	0/0	1/1	0/0	1/1	0/0	0/0	0/0	0/0	/6	0
REFUGEE CAMP / AKOBO SITE (GOG)	0/0	0/0	0/0	2/2	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	2/2	100
REFUGEE CAMP / POCHALLA SITE (GOG)	0/0	0/0	0/0	2/2	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	2/2	100
ABAWIRI (GOG)	0/0	0/0	0/0	0/0	2/2	2/2	1/1	0/0	0/0	0/0	0/0	0/0	5/5	100
OLANE (GOG)	0/0	0/0	0/0	0/0	1/1	0/0	1/1	0/0	0/0	0/0	0/0	0/0	2/2	100
PUGNIDO REFUGEE CAMP (GOG)	0/0	0/0	0/0	0/0	1/1	2/2	0/0	0/0	0/0	0/0	0/0	0/0	3/3	100
OGAGNA (GOG)	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/1	100
AKUMED (GOG)	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0	1/1	100
PERPENGO 2 (ABOBO)	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0	1/1	100
ELIA (ITANG)	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0
AWUKOY (GOG)	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
GAMBELLA TOWN	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
ATHETI (ABOBO)	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
LERONKACHO (SOUTH OMO)	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
WANKAK (ABOBO)	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
THERPAM (ITANG)	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0
TOTAL*	0/0	0/0	1/1	7/7	5/5	7/8	2/2	1/1	0/0	0/0	0/0	0/0	23/24	96
% CONTAINED	0	0	100	100	100	88	100	100	0	0	0	0	96	

* PROVISIONAL.

PRC = PUGNIDO REFUGEE CAMP

MALI

During the first six months of 2009, Mali's GWEP successfully contained and explained the apparent source of all 8 cases of dracunculiasis that occurred in the country. In July-November, the program contained 71% (124) of the 175 cases reported, and explained the apparent source of all but 2 of those cases, one each in October and November, including a case in non-endemic Segou Region. Overall, Mali reports cases have been detected in a total of 49 localities in January-November 2009, of which 25 localities reported only imported cases.

EDITORIAL
SURVEILLANCE AND RESPONSE TO ALLEGED CASES OF DRACUNCULIASIS IN AREAS FREE OF TRANSMISSION IN ETHIOPIA, GHANA, MALI, AND SUDAN

An important component of the current strategy for accelerating the time required for interruption of endemic transmission in the remaining endemic countries (Ethiopia, Ghana, Mali and Sudan) is to improve surveillance and response to alleged cases of dracunculiasis in areas of these countries that are now free of the disease. The one year-long incubation period of Guinea worms allows infected persons to be carriers of the infection during that period and provides ample opportunities for those infected to ambulate widely, and for their Guinea worms to emerge a year later in unexpected places. Such "surprise" outbreaks of dracunculiasis have plagued most national eradication programs during the last stages of their campaigns. Experience thus far is that each time one such outbreak occurs it requires two to three additional years for transmission to be interrupted and additional program support during that time.

Ideally, the creation of widespread public awareness and interest about the importance of the national eradication effort and about the need to report cases of the disease immediately are a necessary ingredient of any effort to improve surveillance nationwide, but more especially in areas free of endemic transmission. Broad dissemination of information about dracunculiasis through all possible means to encourage persons with the disease or suspected of having the disease to self-report or to have others report about those suspected of having the disease can become an engine for generating rumors about possible cases. Publication and dissemination of information about rewards for confirmation of reported cases can also become a potent catalyst for enhancing reporting about persons with suspected dracunculiasis, particularly when annual incidence of dracunculiasis is reduced to a few hundred cases or less, and transmission is circumscribed to one or few areas.

To enhance surveillance and response capacity for these purposes eradication programs are encouraged to establish a national registry for rumors about alleged cases, which includes information about when each rumor is received when investigations are initiated, and about the outcome of each investigation. Development and implementation of protocols for responding to rumors, conducting and recording investigations, and reporting outcomes are also important and necessary requirements.

Three levels of transmission risk can be readily identified in the remaining endemic countries.

- Level 1 is the set of villages where endemic transmission now occurs, and where surveillance should be village-based and active (with daily searches for cases), and where reporting is done monthly.

- Level 2 includes villages where transmission of dracunculiasis has already been interrupted during the last three years, where surveillance is also village-based and where reporting is done either monthly or quarterly.
- Level 3 includes all other formerly-endemic villages and villages that have never had endemic dracunculiasis transmission (where surveillance is either non-existent or passive), and where surveillance and rapid response to rumors about possible cases of the disease are now of much greater importance.

It is helpful to observe the definitions below and also to keep in mind the reasons GWEPs should stimulate reporting about possible cases of dracunculiasis at this stage of the eradication campaign.

- A rumor is defined as information received by the national GWEP about a person with alleged Guinea worm disease (GWD). A rumor is not a case of GWD.
- One presumes that if a rumor is reported it is because a person has signs and symptoms that suggest dracunculiasis, i.e., a suspect case (according to the person reporting it). Hence, in areas now free of dracunculiasis one would expect the specificity of rumors to be low (the majority of rumors are not eventually confirmed as actual cases of dracunculiasis). Whereas in areas where transmission is now endemic, the expected specificity of rumors about a person with signs or symptoms suggestive of dracunculiasis is higher. One must also bear in mind that a suspect case does not become a bona fide case of dracunculiasis until the Guinea worm emerges through a lesion on the skin and is confirmed by an experienced public health official, i.e., meets the international definition for a case of dracunculiasis.

Hence the current eradication strategy now includes an intense focus on interruption of transmission in Level 1 areas as well as prevention of unexpected outbreaks in Level 2 and 3 areas. Monitoring the reporting of rumors, records (by village, district, region and date) and investigations in Level 3 areas is a way of measuring the quality and coverage of surveillance in those areas. It provides a level of assurance to the national GWEP that if a person with signs and symptoms of dracunculiasis comes to a dracunculiasis-free area, detection, reporting, investigation, confirmation, and immediate action steps will be taken to contain transmission.

While it is true that a rumor about a person with suspected dracunculiasis can be generated from anywhere within the national territory, it is important to be able to separate out rumors and investigations in Level 3 areas in order to gauge the coverage and effectiveness of the surveillance and response system in those areas, as distinct from the active surveillance and response system in areas where endemic transmission is ongoing (in Level 1 areas, surveillance is village-based, with daily searches by volunteers, containment of every case, recording of cases in registers with weekly confirmation of cases by supervisors, monthly reporting, etc.; and relies much less on investigation of rumors).

Whereas the volume of rumors received and investigated is a gauge of the intensity of both passive (in disease-free areas) and active (in endemic areas) surveillance, in order for the GWEP to know how well the rumor registry and investigation of suspected cases is working in Level 3 areas it needs to separate out information from those areas from Level 1 and 2 areas. What is important now is to ascertain the rate and extent of implementation of the rumor registry and suspect case investigations in Level 3 areas and monitor how well that system is operating.

WHO COLLABORATING CENTER AT CDC CONFIRMS GUINEA WORMS

In 2005, staff from the WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis (WHOCC) at the U.S. Centers for Disease Control and Prevention developed a molecular assay to identify *Dracunculus medinensis*. Because male worms are never recovered, and female worms contain no species-specific morphologic features, molecular typing is the only way to accurately determine whether a removed worm is *D. medinensis* or another species. If an emergent worm is rapidly identified with certainty as *D. medinensis*, country programs can quickly mobilize to contain and prevent transmission of the infection. If it is not *D. medinensis*, other appropriate actions should be taken, depending on the diagnosis. Using this molecular assay, as well as morphological examination, the WHOCC provides ongoing diagnosis of specimens recovered from persons in two areas of programmatic concern:

1) In areas already declared free of dracunculiasis
2) In endemic areas where few cases are reported and interruption of transmission is imminent.

In both these situations, it is vital to the programs to diagnose true cases of dracunculiasis so that appropriate actions can be taken. A confirmed diagnosis can require extensive efforts by national programs to trace back cases, strengthen surveillance, and potentially even re-initiate other program activities if the case was not contained.

Since 2000, 49 specimens taken from humans in these areas of concern have been sent to the WHOCC for evaluation and 26 have been identified as *Dracunculus medinensis* (Table 8). The remaining 23 specimens were determined to be *Onchocerca* (11), other nematodes (13), and non-worms (such as pieces of tendon, connective tissue, fly larvae, and other debris). Of 10 specimens submitted since 2006, two were identified as GW, two as non-worms, and six as *Onchocerca*. *Onchocerca* specimens have also been submitted from CAR (3), Uganda (1), and one unidentified country.

Ghana has submitted the most specimens (10) for evaluation since 2000, only two of which were diagnosed as *D. medinensis*. Mali has submitted the second greatest number of samples. Between 2000 –2008, the WHOCC received nine specimens from Mali for testing; seven were *D. medinensis* and two were non-worms. The locations and diagnoses of the remaining specimens are summarized in Table 9.

Table 8
Summary of Specimens Received by the WHOCC for Evaluation Since 2000 – By Year

Year	2000	2001	2002	2003**	2004	2005	2006	2007	2008	Jan. - Sept. 2009	Unknown date since 2000	TOTAL
GW	0	2	0	0	2	1	5	2	9	2	3	26
Not GW*	1	0	0	0	5	0	3	2	2	5	5	23
Total	1	2	0	0	7	1	8	4	11	7	8	49

* Nematode–13 (*Onchocerca*–11); Not Parasite–10
** One additional GW from a donkey was received from Mali in 2003 but it is not counted in the totals above.

Table 9
Summary of Specimens Received by the WHOCC for Evaluation Since 2000 – By Country

Country	Ghana	Mali *	Burkina Faso	Uganda	Niger	Cote d'Ivoire	Togo	CAR	Ethiopia	Cameroon	Benin	Nigeria	Unknown	TOTAL
GW	2	7	3	1	4	3	3	0	2	1	0	0	0	26
Not GW*	8	2	2	4	0	1	0	3	0	0	1	1	1	23
Total	10	9	5	5	4	4	3	3	2	1	1	1	1	49

* One additional GW from a donkey was received from Mali in 2003 but it is not counted in the totals above.

IN BRIEF
Niger reported an additional case imported from Mali's Ansongo District in November 2009. The case was successfully contained.

Mr. MAKOY Samuel Yibi, director of the Southern Sudan Guinea Worm Eradication Program (SSGWEP), and Carter Center resident advisor Mr. Alex Jones participated in a live television talk show on SSTV in Juba on November 12 to discuss the SSGWEP, its achievements, challenges and the way forward. This was part of on-going efforts to educate the public and political leaders on the eradication program.

NEW DONATIONA MATCHED BY GATES GRANT
Late in 2009, The Carter Center received four more major donations for Guinea worm eradication in response to the challenge grant pledged by the Bill & Melinda Gates Foundation, which includes an outright contribution of $8 million and an additional $32 million in funds to match gifts from organizations and individuals on a one-to-one basis. The four new pledges are:

- The Kingdom of Saudi Arabia $5 million
- Vestergaard Frandsen $1 million (in cloth filters and pipe filters)
- Dr. and Mrs. John P. Hussman $500,000
- The OPEC Fund for International Development $500,000

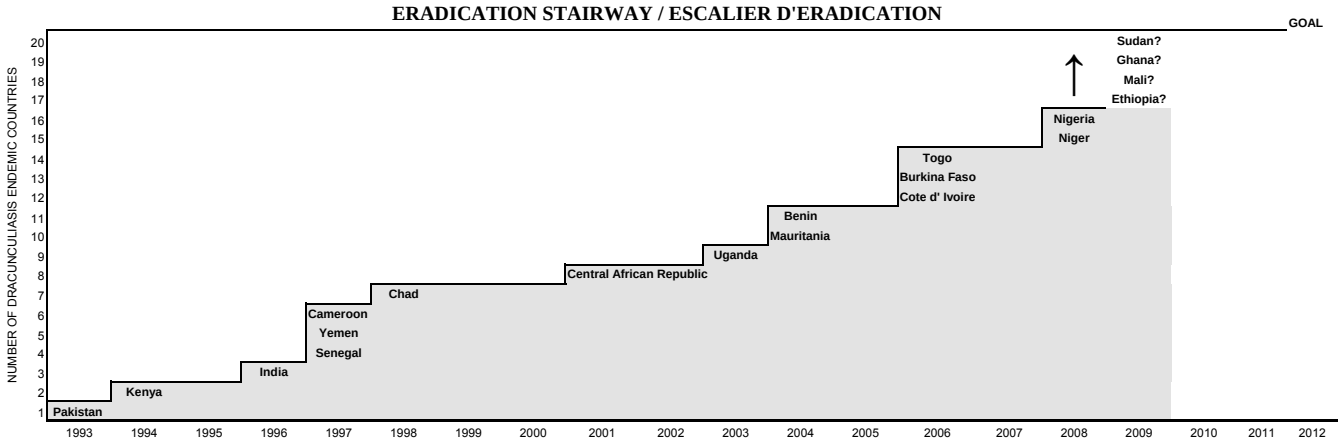
In addition, many other generous donations have been received from individuals, and we reported earlier on the major pledge received from the United Kingdom's Department for International Cooperation (DFID) of £10 million. (Dr. and Mrs. Hussman also donated $500,000 for the Carter Center's trachoma control activities in Southern Sudan.).

Table 10

Status of Interventions Through October 2009 by Country

	# villages reporting 1+ case in 2009	# Cases GW reported in 2009	% Cases Contained	% Cases Contained in CCC
Sudan	982	2690	83%	8%
Ghana	52	240	93%	76%
Mali	91	176	72%	72%
Ethiopia	10	24	96%	96%

Figure 6



MEETINGS

WHO Executive Board Meeting in Geneva, January 18-23, 2010
Program Managers Meeting in Nairobi, March 1-5, 2010.
World Health Assembly in Geneva, May 17-22, 2010

RECENT PUBLICATIONS

McNeil DG, 2009. Campaign to eradicate Guinea worm in hard-hit Nigeria may have worked. New York Times December 8, page D6.

GUINEA WORMS ON THE WEB

Lirri, E. Uganda stamps out Guinea worm disease. Daily Monitor, December 31, 2009. http://www.monitor.co.ug/Magazines/Health%20&%20Living/-/689846/833242/-/3fx5saz/-

Sudan wages war on Guinea worms. October 5, 2009. Gary Strieker reports from Southern Sudan in connection with the Global Health Frontline News Project. http://worldfocus.org/blog/2009/10/05/Sudan-wages-war-on-guinea-worms/7613/.

REMINDER

The GW Wrap-Up web location is
http://www.cdc.gov/ncidod/dpd/parasites/guineaworm/default.htm

Back issues in English and French are also available on the Carter Center web site located at:
http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_english.html.
http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_francais.html

DEFINITION OF CASE 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.

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
Back issues are also available on the Carter Center web site English and Frenchare located at
http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_english.html.
http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_francais.html