DEPARTMENT OF HEALTH & HUMAN SERVICES

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

Date: March 12, 2010

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

Subject: GUINEA WORM WRAP-UP #195

To: Addressees

Detect every case of Guinea worm disease immediately, contain transmission completely, and explain the source of every infection thoroughly.

FORMER PRESIDENT CARTER VISITS SOUTHERN SUDAN GWEP

Former U.S. President Jimmy Carter made a three-day visit to Southern Sudan on February 10-12 to encourage efforts to interrupt transmission of dracunculiasis in Southern Sudan, which reported 86% of all cases of the disease in the world in 2009. President Carter met with President Salva Kiir of the Government of Southern Sudan (GOSS), Minister of Heatlh Dr. Joseph Monytuil Wejang, and other political leaders. Dr. Olivia Lomoro, Director General for Research, Planning, and Health Systems of the GOSS Ministry of Heatlh chaired a meeting of partners, including representatives from WHO, UNICEF, PACT, MEDAIR, Joint Donor Team, CRS, SNV, Swedish Free Mission, USAID and World Bank, which President Carter also addressed, as did Southern Sudan Guinea Worm Eradication Program (SSGWEP) director Mr. Makoy Samuel Yibi, a representative of the GOSS Ministry of Water and Rural Irrigation, and Dr. Mohamed Abdur Rab, WHO country representative. Mr. Makoy noted in his presentation the under-fulfilled promises for providing safe drinking water for Guinea worm endemic villages. He encouraged all concerned to "think outside of the borehole" and distributed a list of the 25 highest endemic villages without safe water that reported 19% of all cases in Southern Sudan in 2009 (Table 1). The GOSS minister of health promised to require monthly reports on the status of water supply provision to endemic villages, and we shall track the status of those 25 villages in the *Guinea Worm Wrap-Up*. **It is time for the water sector in Southern Sudan to shine or be shamed.**

On February 11, President Carter, accompanied by Carter Center President and CEO Dr. John Hardman, Carter Center Vice-President Dr. Donald Hopkins, Mr. Makoy and Carter Center Resident Technical Advisor Mr. Alex Jones, visited the endemic village of Logora, in Terekeka County, Central Equatoria State. The visitors were welcomed by the governor of the state, met a village volunteer, a patient with Guinea worm disease (GWD), and a group of Area Supervisors who were finishing their training. A Press Conference held in Juba after the visit to the endemic village was well attended, including participants from PBS Newshour, Reuters, BBC/Public Radio International, *Al-Jazeera*, *Rolling Stone* magazine, and the *Nation* newspaper from Nairobi, with many but not all questions focused on the impending national elections to be held in April. President Carter also met earlier with political leaders and the Federal Minister of Health in Khartoum.

Table 1

Southern Sudan Guinea Worm Eradication Program
Top 25 Endemic Villages in 2009 without Safe Drinking Water

No.	STATE	COUNTY	PAYAM	BOMA	VILLAGE NAME	CASES			COORDINATES		POP	HH	Protected Wells
						2007	2008	2009	LATITUDE	LONGITUDE			
1	EASTERN EQUATORIA	KAPOETA NORTH	PARINGA	MORUANGILIMO	NAPUSTIRIAE	6		44	4.86797	33.57513	170	58	0
2	EASTERN EQUATORIA	KAPOETA NORTH	PARINGA	MORUANGILIMO	NAWOYAGILAE			34	4.86921	33.56706	192	32	0
3	LAKES	AWERIAL	ABUYONG	MABORADHIAK	MABIOR ADHIAK	23	12	31	6.32983	31.10100	1070	35	0
4	LAKES	AWERIAL	ABUYONG	MABORADHIAK	AKEU	7	34	30	6.32298	31.09190	440	120	0
5	CENTRAL EQUATORIA	TEREKEKA	REGGO	LONGI	LIGGI	0	1	29	5.48580	31.50818	450	75	0
6	WARRAB	TONJ NORTH	AKOP	ACUOLOK	KOOT	0	23	27	8.23195	29.18129	528	88	2
7	EASTERN EQUATORIA	KAPOETA NORTH	CHUMAKORI	MORUNYANG	MORINYANG	4	1	23	4.92374	33.56484	1230	205	0
8	LAKES	AWERIAL	DOR	MAGOK	NYARAR	2	14	22	5.90769	31.17265	342	57	0
9	CENTRAL EQUATORIA	TEREKEKA	REGGO	BURANGA	GWULUKUK	3	3	22	5.44350	31.53862	1800	300	0
10	WARRAB	TONJ NORTH	ALIEK	PATEI	MARIALATHOTH	0	4	21	8.41782	28.62787	60	60	0
11	LAKES	AWERIAL	ABUYONG	JARWENG	JIETYOM	3	14	20	6.18623	31.08864	744	150	0
12	LAKES	AWERIAL	DOR	MAGOK	DUKAZOL	0	2	20	5.89747	31.17035	282	47	0
13	EASTERN EQUATORIA	KAPOETA NORTH	PARINGA	MORUANGILIMO	NARUKEE			19	4.87763	33.5771	186	31	0
14	LAKES	AWERIAL	DOR	MAGOK	PULTHOK	0	0	18	5.87280	31.16285	468	78	0
15	WARRAB	TONJ NORTH	AKOP	ACUOLOK	AWUT-LUOU		2	18	8.20624	29.14686	60	20	0
16	WARRAB	TONJ SOUTH	THIET	YINHKUEL	WAR LANG	0	0	17	7.45326	28.43582	213	42	2
17	WARRAB	TONJ EAST	ANANATAK	MALUAL CUM	GOLPIN	0	0	17	7.92820	29.07796	55	17	0
18	WARRAB	TONJ EAST	MAKUAC	WUNNYIETH	JUBA MAGOK	0	0	17	7.93219	29.27256	200	25	0
19	CENTRAL EQUATORIA	TEREKEKA	TINDILO	RUME	BEKENDING	0	6	16	5.73992	31.03656	1494	249	0
20	LAKES	AWERIAL	ABUYONG	ABUYONG	DAK BUONG			16			150	50	0
21	LAKES	AWERIAL	BUNAGOK	ABUOTBAI	WUNAMETH	14	21	15	6.18228	31.03362	852	142	0
22	LAKES	AWERIAL	DOR	DOR	ABEBIM	1	13	15	6.04985	31.30116	468	78	0
23	LAKES	AWERIAL	ABUYONG	ABUYONG	WUNKUM	1	7	13	6.36928	31.09375	330	11	0
24	EASTERN EQUATORIA	KAPOETA SOUTH	MACHI II	LOKWASUNYON	KASARKIN	9	41	13	4.81208	33.56381	504	83	0
25	WARRAB	TONJ NORTH	AWUL	NOI	MANAGUL			13	8.14566	28.51850	158	40	0
TOTAL						73	198	530			12,446	2093	4

Total cases in the top 25 endemic villages = 530
Total cases of GWD in Sudan during 2009 = 2,751
% of total 2009 cases 19%

Table 2

Southern Sudan Guinea Worm Eradication Program
Incidents of Insecurity Affecting Program Operations: 2010*

No.	Location	Reported cases of GWD		Payam	County	State	Incident	Outcome
		2009	2010*					
1	Alabek	See # 5	See # 5	Alabek	Tonj N.	Warrab	Ethnic fighting	Disruption of GWE activies
2	Wunlit	See # 5	See # 5	Wunlit	Tonj E.	Warrab	Ethnic fighting	Disruption of GWE activies
3	Akot[1]	NA	NA	Yirol E. & Rumbek E.	Rumbek E.	Lakes	Supply truck robbed	Three staff robbed of cassh at gunpoint by SPLA soldiers
4	Cuibet[2]	41		Cuibet & Tonj		Lakes & Warrab	Area-wide ethnic fighting	Disrupted GWE activities, shipment of supplies & trainings
5	Greater Tonj	1,139	6	Tonj N., Tonj S., Tonj E.		Warrab	Area-wide ethnic fighting	Disrupted shipment of supplies & for Warrab and Western Bahr Al Ghazal States
6	Palal Town	See # 5	See # 5	Palal	Tonj E.	Warrab	SPLA retaliation	All GWE activities disrupted. Area supervisor killed & store looted of materials and training supplies

[1] along the road to Yirol Town

[2] Cuibet County only

* Reports received as of March 12, 2010

Table 3

Number of Cases Contained and Number Reported by Month during 2010* (Countries arranged in descending order of cases in 2009)

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	6 / 7	23 / 32	/	/	/	/	/	/	/	/	/	/	29 / 39	74
GHANA	2 / 2	3 / 3	/	/	/	/	/	/	/	/	/	/	5 / 5	100
MALI	0 / 0	0 / 0	/	/	/	/	/	/	/	/	/	/	0 / 0	0
ETHIOPIA	0 / 0	1 / 1	/	/	/	/	/	/	/	/	/	/	1 / 1	100
TOTAL*	8 / 9	27 / 36	/	/	/	/	/	/	/	/	/	/	35 / 45	78
% CONTAINED	89	75											78	
% CONT. OUTSIDE SUDAN	100	100											100	

* 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 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	39 / 47	134 / 221	278 / 428	421 / 460	450 / 524	476 / 548	252 / 281	112 / 143	39 / 55	11 / 14	2228 / 2751	81
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	90 / 101	168 / 256	314 / 468	453 / 494	472 / 556	512 / 593	302 / 352	137 / 181	45 / 63	15 / 19	2613 / 3208	81
% CONTAINED	77	90	89	66	67	92	85	86	86	76	71	79	81	
% CONT. OUTSIDE SUDAN	89	98	94	97	90	94	69	80	70	66	75	80	84	

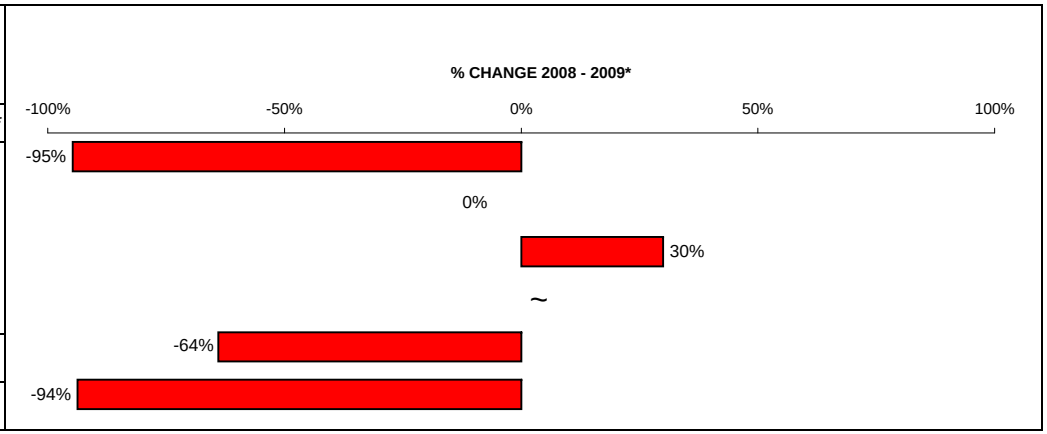
* provisional

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

Figure 1

Number of Indigenous Cases Reported During the Specified Period in 2009 and 2010*, and Percent Change in Cases Reported

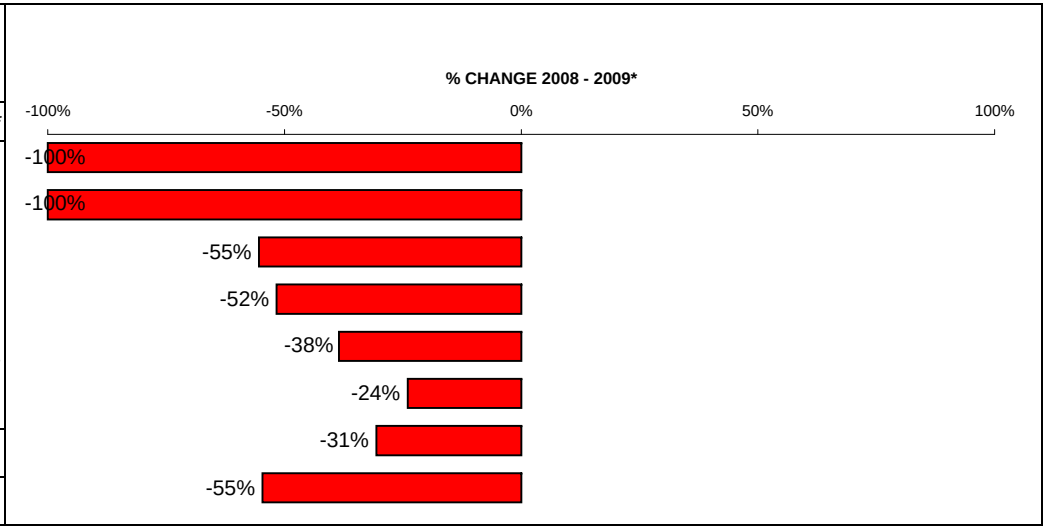
Country	Indigenous Cases Reported	
	2009	2010*
Ghana (2)	95	5
Mali (2)	0	0
Sudan (2)	30	39
Ethiopia (2)	0	1
Total	125	45
All countries, excluding Sudan	95	6



* Provisional: excludes cases exported from one country to another
(2) Indicates months for which reports were received, i.e., Jan. -Feb. 2010*

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)	39	24
Sudan (12)	3618	2751
Total	4615	3203
All countries, excluding Sudan	997	452



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

Table 4

Global Campaign to Eradicate Guinea Worm Disease

Cases of Guinea Worm Disease Reported and Contained During 2008 and 2009 by Country

Country*	Year	Cases			Number of Case Containment Centers (CCCs) in which cases were contained	Number of cases contained at a CCC	% of national cases reported that were contained at CCCs	% of national contained cases contained at a CCC
		Reported (national)	Contained (national)	% Contained (national)				
Sudan	2008	3,618	1,781	49%	0	0	0%	0%
	2009	2,751	2,228	81%	3	211	8%	9%
Ghana	2008	501	428	85%	11	183	37%	43%
	2009	242	225	93%	9	182	75%	81%
Mali	2008	417	354	85%	6	84	20%	24%
	2009	186	135	73%	10	132	71%	98%
Ethiopia	2008	41	32	78%	1	32	78%	100%
	2009	24	23	96%	2	22	92%	96%
Nigera	2008	38	38	100%	1	38	100%	100%
	2009	0	0	0%	0	0	0%	0%
Niger	2008	3	2	67%	3	2	67%	100%
	2009	0	0	0%	0	0	0%	0%
Total	2008	4,618	2,635	57%	22	339	7%	13%
	2009	3,203	2,611	82%	24	547	17%	21%
Total Outside Sudan	2008	1,000	854	85%	22	339	34%	40%
	2009	452	383	85%	21	336	74%	88%

* Excludes one case imported into Burkina Faso in 2008 and 5 cases imported into Niger in 2009

ETHIOPIAN MINISTER OF HEALTH VISITS THE ETHIOPIAN DRACUNCULIASIS ERADICATION PROGRAM IN GAMBELLA REGION.

The Minister of Health of Ethiopia, the honorable Dr. Tedros Adhanoum Ghebreyesus, was warmly welcomed at the Gambella airport by the President of the Gambella National Regional State, Ato Umed Obong, and his cabinet members. Accompanying the minister were Dr. Daddi Jima (Deputy Director General, Federal Ministry of Health (FMOH), Mr. Gole Ejeta (national coordinator, Ethiopian Dracunculiasis Eradication Program - EDEP) and Mr. Teshome Gebre, Resident Technical Advisor, The Carter Center.

The minister led a meeting with about 40 stakeholders, regional authorities from health and other sectors in Gambella, and EDEP staff. The regional EDEP coordinator, Mr. Nena Okello, gave a brief overview of the program in Gambella Region, which was followed by a lively question and answer session, including major challenges and set backs the program has encountered over the years. The meeting was co-chaired by the regional president and the minister of health.

The minister of health, the vice president of the region and all regional cabinet members also visited Gog Woreda (district), the only known remaining area with endemic dracunculiasis in Gambella Region, and held a community meeting in Fugnido Town (administrative center of Gog Woreda) to discuss the status of the program, followed by a brief visit to the Case Containment Center, where the group saw the first 2010 case of Guinea worm disease. Transmission of the disease from this case was successfully contained, and its source partially explained. (Ethiopia reported one uncontained case in 2009, in June).

Recommendations were:

- To intensify social mobilization throughout Gambella Region with particular focus in Gog Woreda.
- The regional government was requested to effectively mobilize the endemic communities in Gog Woreda in particular and in the Agnuak tribal group zone in general, for effective surveillance and case containment.
- To mobilize partners for improving the water supply status of Gog Woreda, including repair and maintenance of broken pumps and drilling additional borehole wells in key endemic villages such as Awukoy and Abawiri.

The visit and in particular the discussion with the stakeholders were extremely important in raising awareness among the authorities and the public in general and received intense attention by press media and other representatives. Moreover, the visit was very motivating for the community and local government in the area.

Ethiopia has reported less than 100 cases per year for each of the past 10 years (Figure 2).

GHANA: -89% REDUCTION IN CASE SINCE JULY 2009

As illustrated in Figure 3, Ghana's GWEP has realized a dramatic reduction of cases between July 2008-February 2009 (180 cases) and July 2009-February 2010 (19 cases), for a reduction of -89%. During a visit to Accra to attend an African Regional Conference on the Right of Access to Information, President Jimmy Carter paid courtesy visits on Ghana's President John Atta Mills, as well as Minister of Health Benjamin Kumbour on February 6. He was also briefed on the status of Ghana's Guinea Worm Eradication Program by the national coordinator, Dr. Andrew Seidu-Korkor, and The Carter Center's resident technical advisor, Mr. Jim Niquette. The peak transmission season for Guinea worm disease in Ghana is October – April.

The Ghana GWEP aims to interrupt transmission of the disease during 2010. All five of the cases reported by Ghana in January-February 2010 have reportedly been contained, and the sources of transmission of all five cases have been explained satisfactorily.

WHO TEAM VISITS GHANAIAN GUINEA WORM ERADICATION PROGRAM DURING JANUARY 17-27, 2010

A team from WHO visited Ghana to assess the surveillance system in place for the guinea worm-free areas and to identify the need for enabling an optimal system. The WHO team was led by Dr Daniel Kertesz, the WHO representative in Ghana, and included Dr Gautam Biswas, Team Leader for guinea worm disease eradication at WHO/HQ, Dr Alhousseini Maiga, Regional Advisor for guinea worm eradication at WHO/AFRO and Mr Edward Gyepi-Garbrah from the WHO country office. The group interacted with several officials at the regional and national level of the Ghanaian Health Services including Dr Andrew Seidu-Korkor, the National Programme Manager and Mr Jim Niquette of The Carter Center in Ghana. The first two days were devoted to the review of the implementation of the 2009 plan of action. Most of the planned activities were satisfactorily implemented. However, the communication strategy needs to be further strengthened. The meeting was followed by field visits to villages, health centres, the district and regional health offices to assess the implementation on the ground in Savelugu-Nanton district (Northern Region) including Pong Tamale (a guinea-worm free sub district), Gulumpe/Kintampo North district (Brong-Ahafo), Kintampo South district (Brong-Ahafo), Ejura- Sekyedumasi district (Ashanti).

The WHO team in collaboration with the Ghana GWEP and The Carter Center forged the plan for 2010 for surveillance based on the lessons learned. The components included i) keeping a focused effort on the 824 formerly/currently endemic communities during 2010 to ensure adequate surveillance and social mobilization/creation of awareness at community level as well as, of all health staff; (ii) the need to improve the quality and the coverage of supervisory activities through the use of standardized tools (check-list), at all levels; (iii) the need to use effectively the integrated disease surveillance and response system (IDSR) including community based surveillance volunteers (CBS) to ensure nationwide surveillance and creation awareness of communities and health staff; (iv) the cash reward system could be used by the end of the year, if zero case or few cases are reported in Ghana, during 2010; and (v) the need to rationalize the number of meetings and reallocate resources to ensure better supervision, on job training and communication for social mobilization.

Figure 2

Ethiopia Dracunculiasis Eradication Program
Number of Cases of Dracunculiasis Reported: 1993 – 2009*

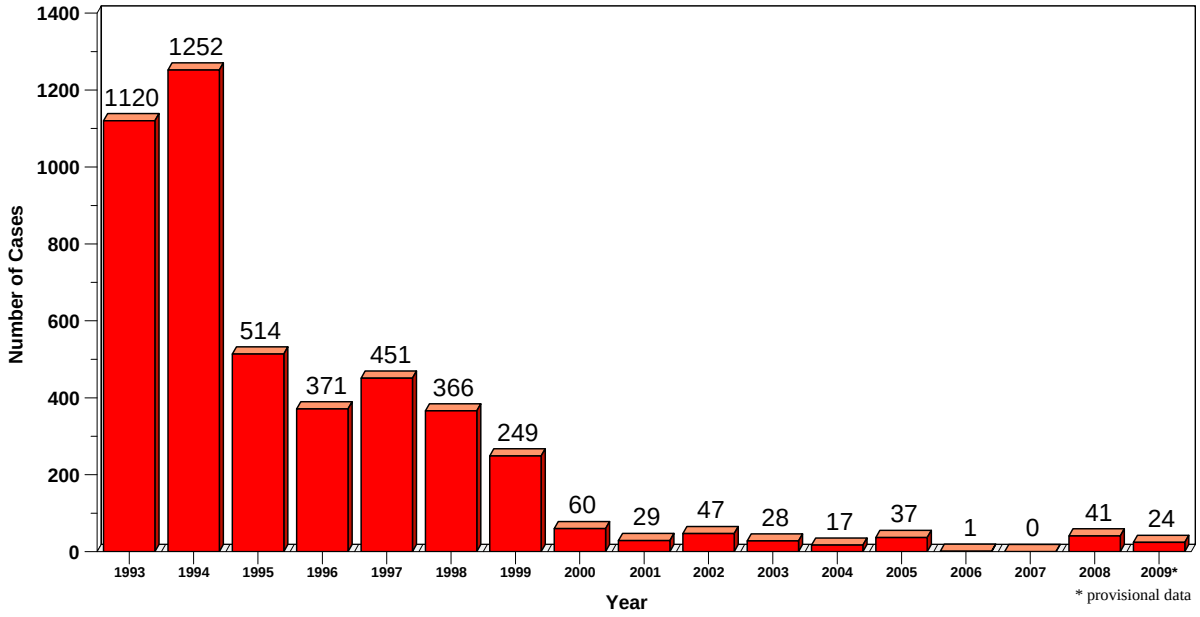
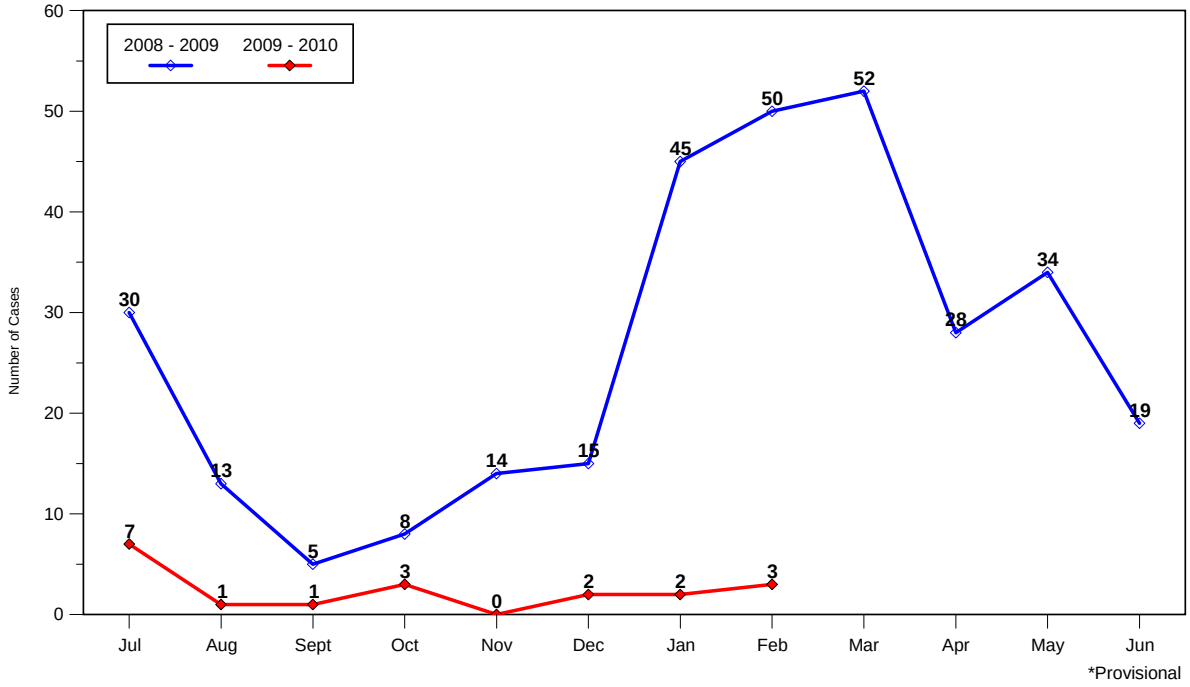


Figure 3

Ghana Guinea Worm Eradication Program
Number of Cases of Dracunculiasis Reported:
July 2008 – June 2009* and July 2009 – Feb 2010*



MALI: INCREASED CASES IN GAO DISTRICT, REDUCTIONS EVERYWHERE ELSE

Mali's GWEP recorded a provisional total of 186 cases in 2009, for an overall reduction of -55% in cases compared to the 417 cases reported in 2008. The cases in 2009 were reported from 52 localities, of which 24 had indigenous transmission. However, Gao District reported an increase in cases of 134% (from 35 to 82), while all other districts combined reported a reduction of -73% (from 382 to 104) (figure 4).

WHO LEADS ASSESSMENT OF NIGERIAN GUINEA WORM ERADICATION PROGRAM (NIGEP) DURING FEBRUARY 1 – 16, 2010

Following the last reported indigenous dracunculiasis case in November 2008, the Federal Ministry of Health requested WHO to assist in carrying out an independent evaluation with the following objectives:

- confirm interruption of local transmission of dracunculiasis in Nigeria;
- assess the quality and extent of integrated Guinea worm disease surveillance within the national disease surveillance and response system;
- assess the capacity of affected communities and the surveillance system in place to detect and contain any case, if it occurred;
- assess the quality and extent of documentation of all pre-certification activities;
- evaluate safe water supply coverage in the target areas and other villages at risk;
- formulate relevant recommendations to improve pre-certification activities.

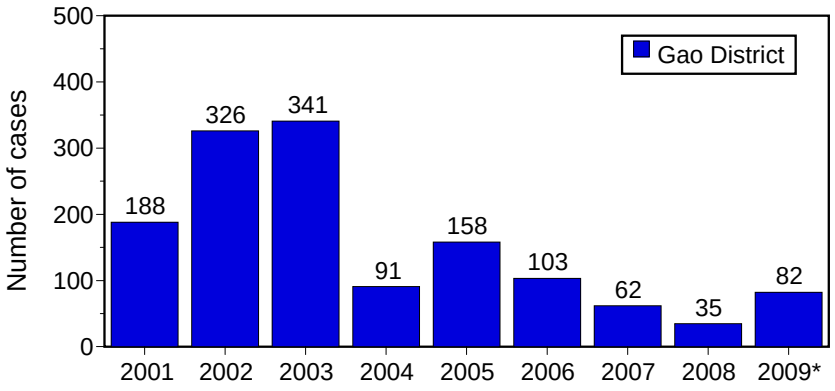
The evaluation, led by Dr. Abolhassan Nadim, a member of the International Commission for Certification of Dracucunculiasis Eradication, included external experts Dr. Sharon Roy, CDC/Atlanta, Mr. Michael Forson, UNICEF/Ghana, Dr. Gautam Biswas WHO/Geneva, Dr. Dieudonne Sankara, WHO/Geneva, Mr. Patrick McConnon, Consultant/USA, Dr. Sadi Moussa, Ministry of Health/Niger and was complemented by independent national experts Dr. Lola Sadiq, Dr. Susan Etim, Dr. Oka Obono, Professor Okwali Amali, Dr. Joshua Ologe, and Mr. Adamu Sallau.

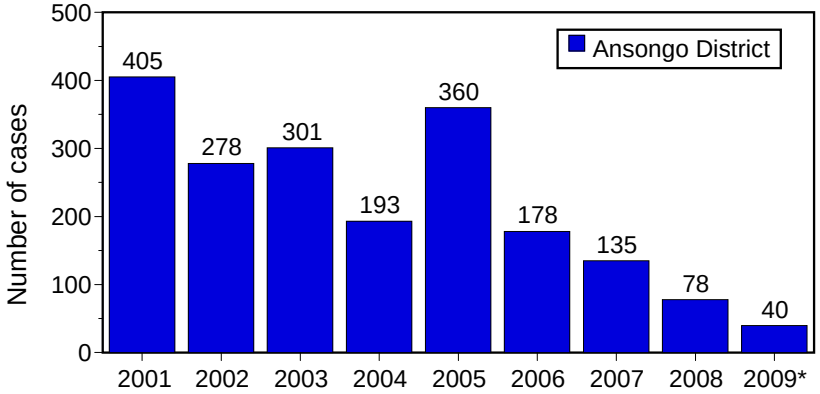
After an in-depth review of the NIGEP strategies and progress as reported by the NIGEP coordinator, seven teams of evaluators visited 15 States, 40 Local Government Areas (LGAs), and 136 villages. 35 of the villages were selected out of the 50 villages identified by NIGEP as being at-risk and under active surveillance. The field reviews were carried out using standardized questionnaires, and review of records and reports.

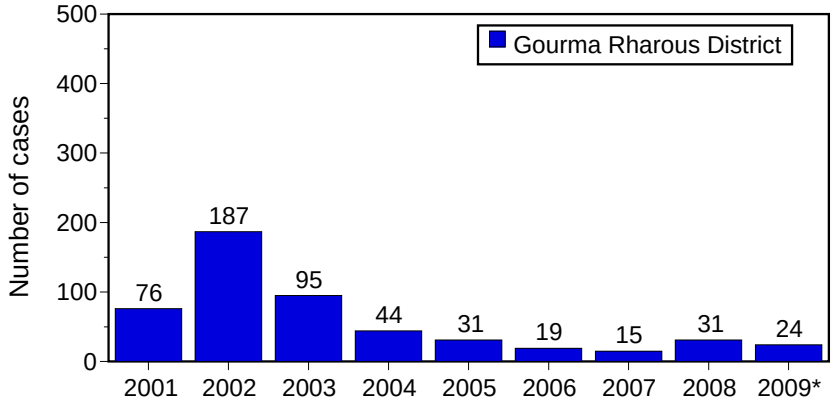
Based on the assessment, it was concluded that while interruption of transmission appears to have occurred in Nigeria, the possibility of hidden cases needs to be ruled out from foci where the team came across rumours of cases in the past 1-2 years that were not investigated or recorded in the rumour registers. The NIGEP in collaboration with IDSR needs to strengthen its ongoing nation-wide surveillance. The awareness of reward for reporting dracunculiasis cases needs to be more widely disseminated nation-wide through appropriate communication strategies. The sensitivity of surveillance to detect any case of dracunculiasis outside of the formerly endemic areas within 24 hours needs to be further strengthened.

Figure 4

Mali Guinea Worm Eradication Program
Reported cases of dracunculiasis: 2001 - 2009*







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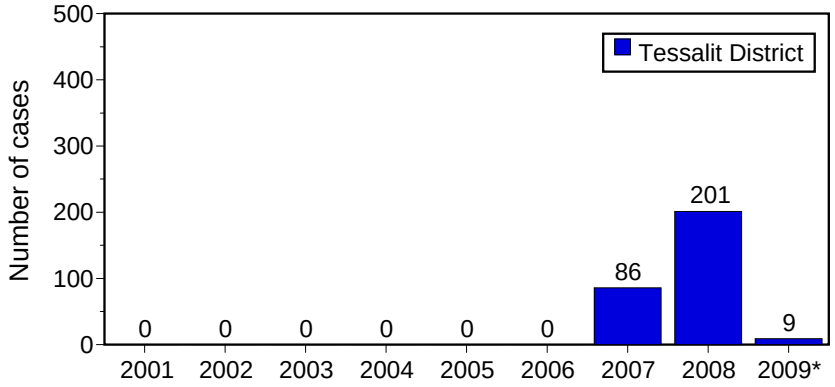

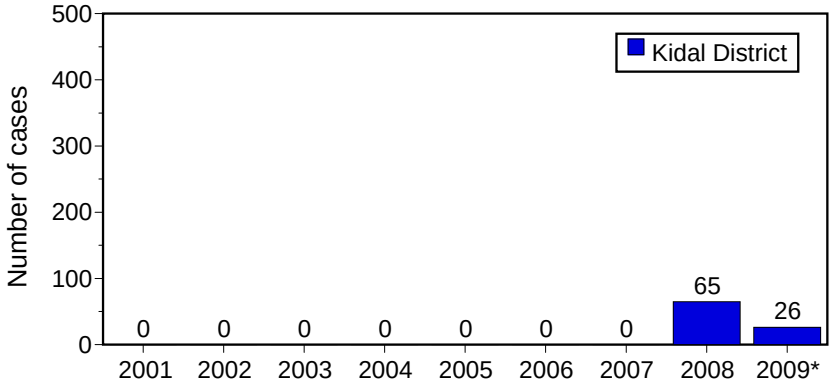

The evaluation revealed that 36 (72%) of the 50 villages under active surveillance have inadequate safe water sources, out of which 8 (16%) have no single source of safe water. This gap in the water supply requires immediate and urgent attention. The extent and quality of documentation of pre-certification activities was observed to be satisfactory. The National Certification Committee, which meets twice a year, also carried out situational assessments in the states in 2009.

The evaluation team acknowledged the full cooperation and support received from FMOH, NIGEP, the State and LGA authorities which allowed it free access in the evaluation. The contribution of The Carter Center, UNICEF and WHO in providing logistic support was also acknowledged. The team congratulated the Government of Nigeria, the Federal Ministry of Health and the NIGEP in reaching the milestone of reporting zero cases since November 2008.

WHERE IS TRANSMISSION OF GUINEA WORM DISEASE OCCURRING?

Towards the end of a national campaign, when few cases of Guinea worm disease (GWD) remain and interruption of transmission appears imminent, it is not only paramount to detect every case and contain transmission from every Guinea worm that emerges, but it is also critical to thoroughly determine and explain the source of every infection. Without a clear understanding of **when, where, and why** transmission occurred, interventions aimed at interrupting transmission may not be targeted effectively. There are four possible reasons (all related to surveillance) that may allow transmission of GWD to continue in an area despite interventions:

1. Failure to detect and contain transmission from cases on time (allowing contamination of sources of water).
2. Failure to detect cases at all (insensitive surveillance)
3. Failure to detect and contain transmission from 2nd or 3rd …etc., emerging Guinea worms, after a person is declared a case.
4. Failure to understand when, where and why persons contracted GWD the year before and their associated risk-factors.

[A fifth possibility (that is different and rarer) may result from reporting other tissue parasites for GWD, i.e., false positives due to other worms mimicking GWD, for example *Onchocerca volvulus.* This would not allow transmission of GWD.]

The end-point of the campaign to eradicate dracunculiasis is well known to all of us, i.e., to stop transmission of the disease in every place where it occurs. Stated more simply, stopping transmission means preventing everyone with emerging Guinea worms from contaminating sources of drinking water and stopping people from drinking contaminated water. If these objectives are understood by all of us, why is it that it has been so difficult to make more rapid progress in preventing infected persons from contaminating sources of drinking water and from drinking contaminated water?

Clearly, the quality of surveillance and interventions against the disease, the quality of supervision, and cultural factors are all parts of the answer to the question. However, too often Guinea Worm Eradication Programs [GWEPs] have not focused enough on concentrating their available time and resources on those places where transmission is really occurring. With only

457 cases reported outside of Sudan from 115 villages during 2009, leaders must be constantly aware of which strategies and interventions are being applied, where and why. As the number of reported cases decreases, the GWEPs must intensify and improve the quality of all interventions. GWEPs must move aggressively to intensify health education, social mobilization and to improve the effectiveness of case containment by making surveillance more active, to detect every case as the Guinea worm(s) emerges or before and to effectively contain transmission from every worm that emerges. Below is a short list of critically important issues that require immediate attention as well as recommendations for resolving them, during this critical phase of the eradication campaign.

1. The preferable goal now is to detect probable cases preferably during the pre-emergence stage, but if not possible, detect all cases within 24 hours of worm emergence and prevent patients from contaminating sources of drinking water, i.e. "contain cases".

> Flaw: There may be a disconnection between the above standard and the actual frequency of surveillance at the village level. To adhere to the standard, searches for cases need to be conducted daily in endemic areas. If cases are not detected the day the Guinea worm emerges or too much time elapses, the patient has a greater likelihood of contaminating water. Allowing GW patients to ambulate freely after detection, runs a high risk of allowing contamination of water which should be avoided if at all possible.
>
> **Recommendation**: Surveillance must be pro-active, there must be sufficient manpower at the village level to search for cases daily in an effective manner, and supervision of the case containment process needs to be done weekly at the village level to also match the tempo of surveillance for cases. Part of the standard for case containment includes having supervisors confirm the containment process within 7 days of the occurrence of the case. These supervisory confirmation visits to the village may not be necessary if the patient is admitted to a case containment center with signs and symptoms compatible with GWD or immediately after the GW emerges.

2. The goal of every GWEP is to detect every case of GWD where ever and when ever the Guinea worm emerges from a person and to prevent transmission.

> Flaw. The one year incubation period of GWD allows persons with the infection to move (without any signs or symptoms) over long distances and have their Guinea worms emerge in places that may be quite distant from the original source of the infection. Whereas surveillance for cases of GWD in the known endemic villages is pro-active and village-based, and has a very high probability of detecting every case of the disease, that is less likely in areas now free of the disease.
>
> **Recommendation.** All remaining endemic countries should make effective use of the assistance provided by the World Health Organization (WHO) to strengthen capacity for detection, reporting and prevention of transmission from cases of GWD, including reporting about investigations and outcomes of reported alleged cases in areas now free of the disease. Although all four remaining endemic countries have now implemented the use of rumor registers, only two (Ethiopia and Mali) offer monetary rewards for reporting alleged cases that are confirmed as GWD. Whereas Ghana should be ready to begin using monetary rewards as an engine for engendering reports about alleged cases of GWD in

non-endemic areas of the country during 2010 - 2011, Southern Sudan should wait until their annual case load is reduced to few hundred cases or less before doing so.

3. A case of Guinea worm disease is the first occurrence in a person during a calendar year of a skin lesion with a Guinea worm protruding from the lesion.

Flaw: Only **new** cases are reported through the system. The records for persons having 2nd, 3rd, or more Guinea worms are usually not reported since these are not new cases. Hence, any failures to fully contain transmission from persons having more than one Guinea worm may help explain why high rates of case containment may not be followed by a commensurate reduction in overall cases the following year. Such failures may also help explain the occurrence of unexpected outbreaks of the disease a year later.

Recommendation: Require that all supervisors leave a copy of their logs (which they routinely must keep to determine who is a new case or not) containing information on the containment of transmission from all persons having additional Guinea worms emerge during the calendar year, and that they maintain an accurate record of these events and outcomes at the District level. Higher-level supervisors are expected to inspect these records to evaluate the consistency of quality of efforts to contain transmission at the village or case containment center level.

4. An endemic village is one where chains of locally acquired infections with Guinea worm disease can be established, i.e., villages where locally acquired cases during the last year or longer are linked.

Flaw: The vast majority of villages in endemic countries outside of Sudan that reported cases in 2009 reported less than 5 cases. The majority of cases from villages reporting 1-4 cases only were likely imported from elsewhere within the country or from a neighboring endemic country. Currently, these investigations are still not being done systematically or consistently in all places. As a result, most of these cases are never investigated (or investigated inadequately) but invariably these villages are automatically declared by the GWEP as 'newly infected", implying that transmission of the disease is now endemic and all of the interventions against the disease are to be provided to these villages (without valid confirmation as to whether transmission is endemic or not).

Recommendation: Investigate all alleged cases from villages that during the preceding year did not report cases or that reported only imported cases to determine if the infection may have been acquired elsewhere and to cross report such cases to the probable place where the infection originated. Report these as "villages under surveillance because of imported cases" and do not include these in the listing of endemic villages unless endemic transmission is established. Activate village volunteers to carry out surveillance, and provide training, materials, and supervision. Apply ABATE® Larvicide only if the case investigation reveals the imported case(s) contaminated sources of drinking water (there is a 10-day window of time after contamination to apply the Abate and prevent any secondary transmission). Implementation of other interventions is unnecessary unless evidence dictates so.

A questionnaire, used recently in Ghana, to investigate every person declared a case of GWD in 2009 in one district is reproduced in the addendum below and may be useful for this purpose after proper adaptation in other endemic countries.

OMAN DONATES $1 MILLION TO GUINEA WORM ERADICATION CAMPAIGN

On February 23, President Carter was visited by Her Excellency Ambassador Hunaina Sultan Al-Mughairy of Oman. On behalf of His Majesty Sultan Qaboos bin Said Al Said, the Ambassador delivered a check for $1 million to support the Guinea Worm Eradication Program. This gift will be matched one-to-one by the Bill & Melinda Gates Foundation. Oman is a strong supporter in the global campaign against Guinea worm disease. Their first contribution to the program was a two-year grant of $1 million provided in 2004. This new grant will support program activities during fiscal years 2011-2013. In gratitude, President Carter presented Ambassador Al-Mughairy with a leather-bound copy of his book, *Beyond the White House*. Ambassador Al-Mughairy is the Sultanate of Oman's first female ambassador, and the only female ambassador to represent an Arab country in the United States. Oman's generous donation and continued partnership are greatly appreciated in the fight to rid the world of this debilitating disease.

IN BRIEF:

Nigeria's Federal Minister of Health, the Honorable Prof. Babatunde Osotimehin, held a press briefing in Abuja January 27, 2010 in which he informed the public of the "significant achievement" in which Nigeria had reported zero cases of Guinea worm disease for over twelve months, since November 2008. He thanked all Nigerians and their partners for the achievement, and pledged that the country would maintain adequate surveillance to ensure no cases remain or return.

Addendum: Ghana questionnaire

Interview Instrument for 2009 cases (exposed in2008)

Date:
Case number:
Age
Gender
Occupation
Ethnic group
Other characteristics
Name of town/village:

HOUSEHOLD

1. What is your household name?

2. Have you lived in same household for past two years?
   If no: 2a. Where did you live previously?

3. Have any of your household members had Guinea worm in the past two years?
   If yes: 3a. Who?
   3b. When?
   3c. What relationship are they to you?
   3d. What activities do you share?

4. Have you had Guinea worm before 2009?
   If yes; 4a. When?
   4b. Where were you living?

5. Where did you get your household drinking water from last year?

6. Where did you get your household drinking water from two years ago?

SCHOOL

7. Are you a student or were you a student two years ago?
   If no, skip to Q.12:

8. What is the name of your school?

9. Did you attend this school two years ago
   If no: 9a. What school did you attend?

10. Were there any children in your school who had Guinea worm the past two years?
    If yes: 10a. Who?
    10b. When?
    10c. What activities do you share?

11. Where do you get your drinking water from at school?

SWIMMING

12. Where do you go swimming?

13. Where else do you go swimming?

14. Do you go swimming with other friends?
    If yes: 14a. Who?
    14b. Where?
    14c. How often?
    14d. Have any of them had Guinea worm?
    If yes: 14e.Who?
    14f. When?

FARMING

15. Does your family have a farm?
    If no, skip to Q.23

16. Do you work on this farm?

17. What is the farm area called?

18. Where is the farm located?

19. What is the name of the stream or pond that you get water from on your farm?
    If stream: 19a. When does the stream "cut"?
    19b. When does that dry up?
    If pond: 19c. When does it fill up?
    19b. When does it dry up?

20. When it dries up, where do you get your water on your farm from?
    20a. When does it fill up?
    20b. When does it dry up?

21. Do other family members work on the farm?
    If yes: 21a. Have any of them had Guinea worm in the past three years?
    If yes: 21b.Who?
    21c. When?

22. Do other people besides family members regularly help you on your farm?
    If yes: 22a. Who are they?
    22b. Do they help sow? (April – June)
    22c. Do they help harvest? (Sept – Nov)
    22d. Have any of them had Guinea worm in the past three years?
    If yes: 22e.Who?
    22fe. When?

23. Do you visit other farms to help *(repeat 23a – 23e for each farm visited)?*
    If yes: 23a. What is the farm area called?
    23b. Where is the farm located?
    23c. What is the name of the farm ponds that they get water from?
    23d. Do you help sow? (April – June)
    23e. Do you help harvest? (Sept – Nov)
    23f. Has anyone on that farm had Guinea worm in the past three years?
    If yes: 23d.Who?
    23e. When?

24. Do you have another occupation *(ask about all risks associated)?*

HERDING

25. Do you herd or join others to herd animals?
If no, skip to Q.31

26. Where do you herd the animals?

27. What is the water source there?

28. Do you go swimming in this water?

29. Do you drink this water?

30. Have any of the other children you herd with had Guinea worm in the past two years?
If yes: 30a. Who?
30b. When?
30c. Have you gone swimming with this person?
30d.What other activities do you share with this person?

HUNTING

31. Do you hunt or join others to hunt?
If no, skip to Q.37

32. Where do you hunt (List all places)?

33. What is the water source there? (List all places)

34. Do you go swimming in this water?

35. Do you drink this water?

36. Have any of the other people you hunt with had Guinea worm in the past two years?
If yes: 36a. Who?
36b. When?
36c. Have you gone swimming with this person?
36d. What other activities do you share with this person?

FISHING

37. Do you fish or join others to fish?
If no, skip to Q.43

38. Where do you fish? (List all places)

39. What are the water sources there? (List all places)

40. Do you go swimming in this water?

41. Do you drink this water?

42. Have any of the other people you fish with had Guinea worm in the past two years?
If yes: 42a. Who?
42b. When?
42c. Have you gone swimming with this person?
42d.What other activities do you share with this person?

TRAVEL

43. Have you traveled outside your village in the past two years? (prompt: for weddings, funerals, shopping, etc.)
    If yes: 43a. Where?
    43b. When?

If traveled to known Guinea worm endemic village, ask:

44. Where did you stay when you were there?

45. Where did you get your drinking water from when you were there?

46. Did you farm when you were there?
    If yes; 46a. Where?
    46b. What is the name of the pond on the farm?

47. Did you see anyone with Guinea worm when you were there?
    If yes; 47a. Who?

CASE ASSOCIATION

Read out loud the names of people in their village who had Guinea worm during the same time they did.

As you list the names, ask them to comment on any association.

For example:

- If they know the person
- If they live near the person
- If they are related
- If they farm together
- If they farm near each other
- If they gather water from the same source
- If they attend the same school
- If they swim together
- If they share other activities or relations

Additional comments and observations:

Table 5

Dracunculiasis Eradication Campaign

Reported Importations and Exportations of Cases of Dracunculiasis: 2009*

From	To	Month and number of cases imported													Number of caes exported
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Total	
Ghana	Niger	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Mali	Niger	0	0	0	0	0	0	0	0	2	1	1	0	4	4
Total		0	0	1	0	0	0	0	0	2	1	1	0	5	

* Provisional

RECENT PUBLICATIONS

Lodge M, 2010. And then there were four: more countries beat guinea worm disease. BMJ, 340:c496.

TRANSITIONS

Dr. Dieudonne Sankara the former national coordinator of Burkina Faso's GWEP, has joined the Guinea worm eradication team at WHO headquarters in Geneva. He recently worked for USAID-funded RTI program on Neglected Tropical Diseases in Washington. Welcome back to the Guinea worm campaign Dr. Sankara!

MEETINGS

- 14th Guinea Worm Program Managers Meeting. The Carter Center. March 27, 2010.
- Guinea worm eradication discussions with ministers of health from the four remaining endemic countries at Geneva during the World Health Assembly on May 19, 2010.

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, CGH, 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 French are 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