



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 Mirji and more recently by Mr. Adamu Keana Salihu 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 @Viade), 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 assist 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 through 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 evaluation of the program on February 1-15, 2010, to inaugurate Nigeria's entry into the 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 #186, 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*	
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)

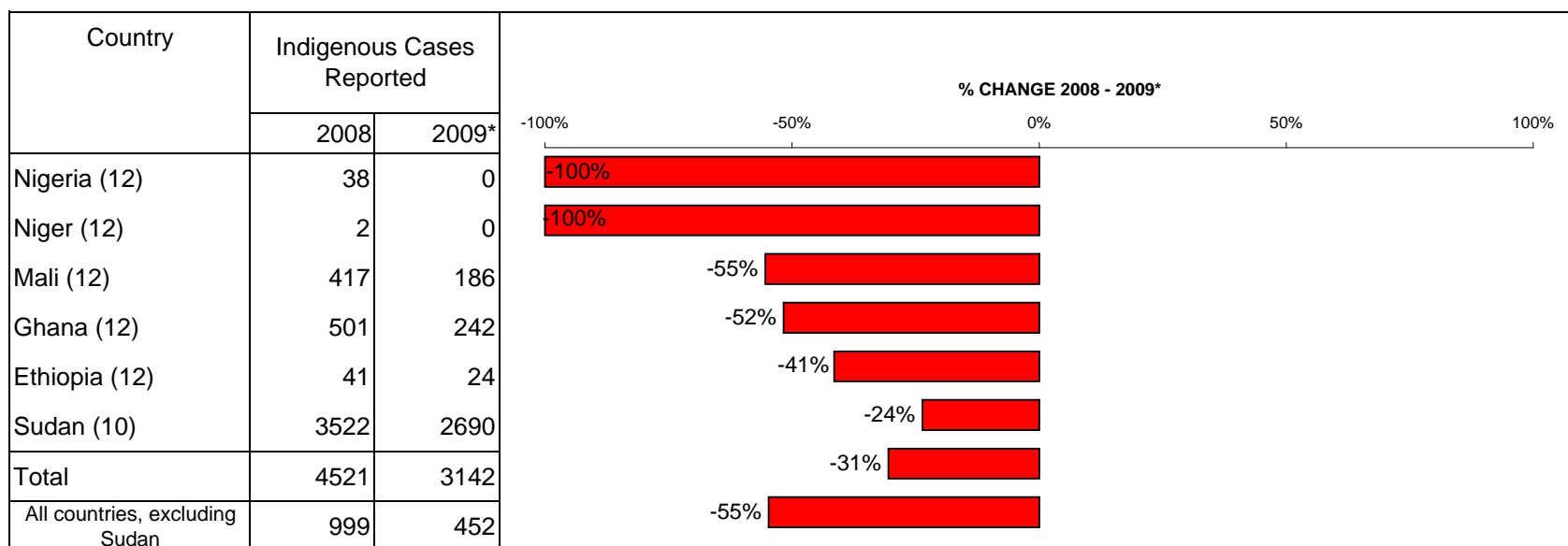
COUNTRIES REPORTING CASES	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED													%
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL*	
SUDAN	8 / 32	13 / 34	39 / 88	112 / 258	259 / 618	394 / 759	399 / 783	313 / 536	126 / 254	94 / 160	16 / 75	8 / 21	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



\* 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 (SSGWE~~P~~) convened its 4<sup>th</sup> 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, ~~Makoy Samuel Yibi~~ Makoy Samuel Yibi reported that after almost four years of interventions by the SSGWE~~P~~, only ~~two~~ ~~one~~ of the original four focal areas now remain: Greater Tonj (Warrap State), Central Equatoria ~~State~~ and Greater Kapoeta (Eastern Equatoria State) (Figure 4, Table 5). The SSGWE~~P~~ reported a provisional total of 2,690 cases of dracunculiasis in January - October 2009, of which 87% occurred in only ~~two~~ ~~one~~ of Southern Sudan's ten states (Warrap, Eastern Equatoria and Lakes), and when Central Equatoria ~~State~~ ~~was~~ included, 97% of cases occurred in four states (Table

A total of 982 villages reported 1 or more cases 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, n

Equatoria, Warrap and Bahr Al-Ghazal States in July-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

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%
<b>Total</b>	<b>2,690</b>	<b>2,246</b>	<b>83%</b>	<b>10,538</b>	<b>88%</b>	<b>747</b>	<b>28%</b>	<b>502</b>	<b>19%</b>	<b>2,181</b>	<b>1,867</b>	<b>86%</b>	<b>81%</b>	<b>1,279</b>	<b>93%</b>	<b>245</b>	<b>11%</b>	<b>9%</b>

\* provisional



Figure 4

Table 5

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

Greater Kapota

Warrap

Central Equatoria

## 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 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 Fulfulbe 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

Ghana Guinea Worm Eradication Program  
Percentage Change in Monthly Incidence of Dracunculiasis 2008 – 2009\*,  
and Percentage of 2009\* Cases that were Contained each Month

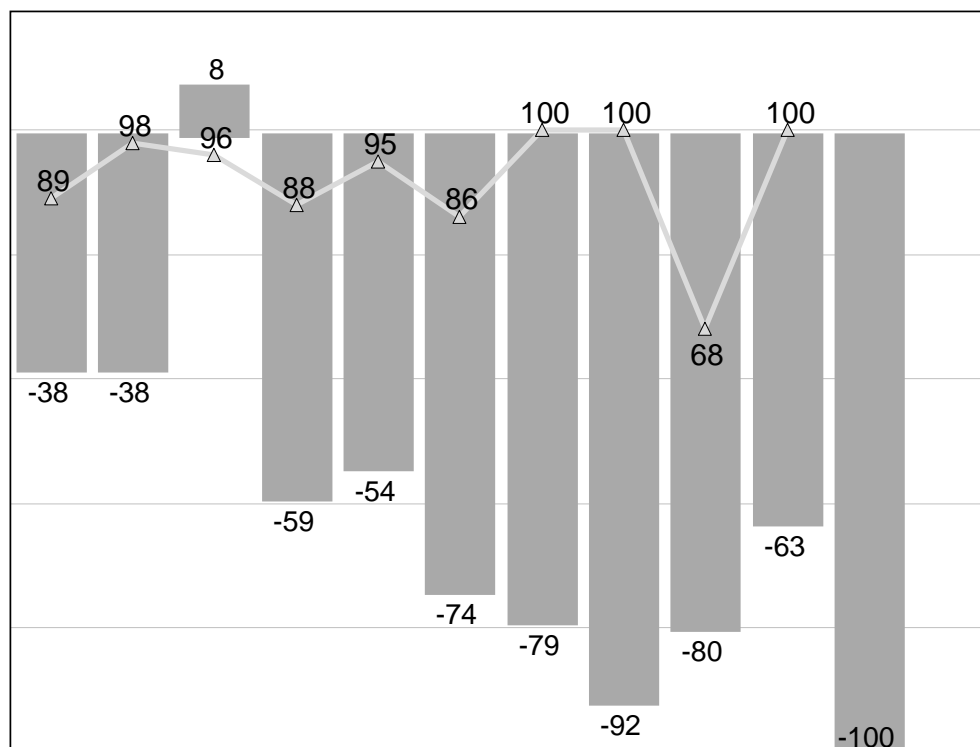
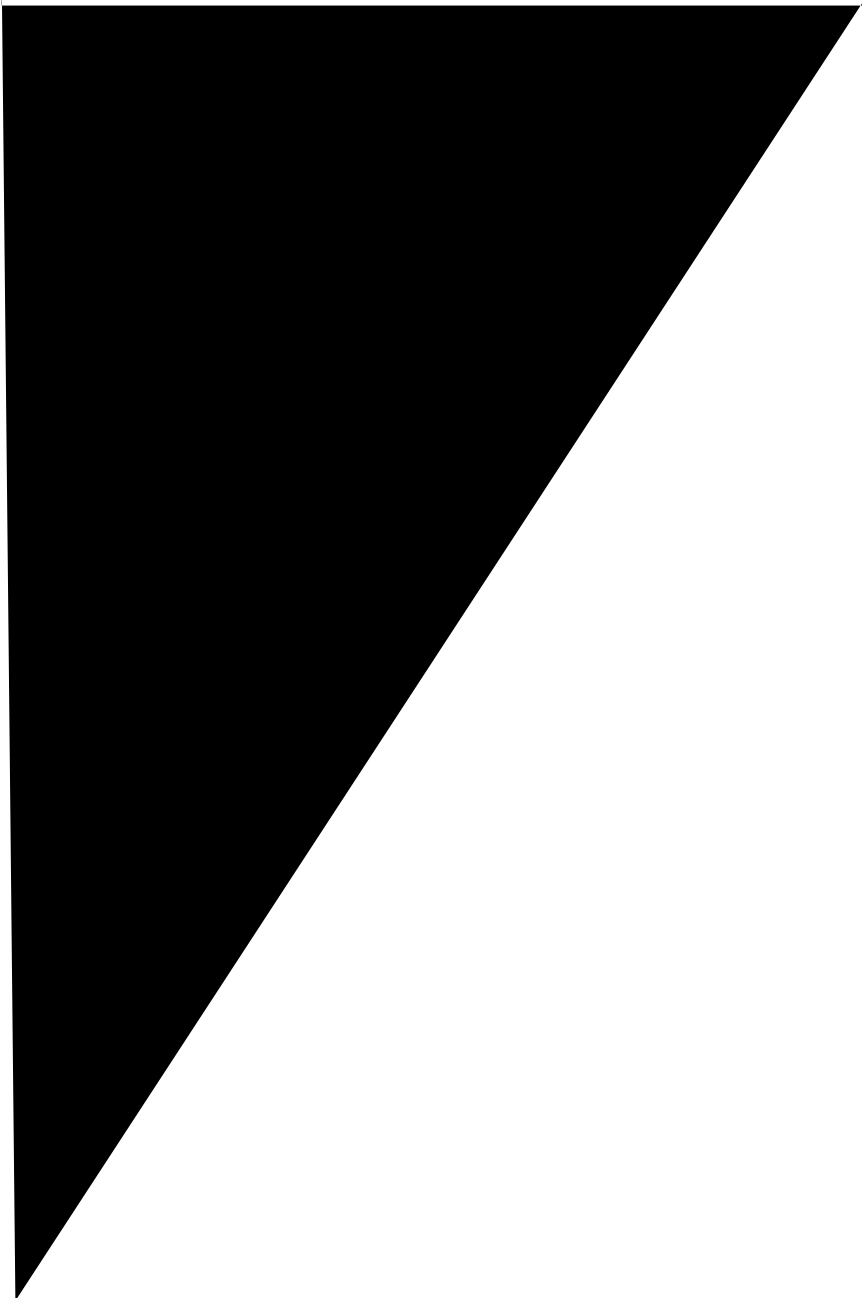


Table 6

## 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%



## 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 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 ALLEG

Level 2 includes villages where transmission of dracunculiasis has already been interrupted during the last few 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 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 because a person has signs and symptoms that suggest dracunculiasis, i.e., a suspected case (according to the person reporting it). Hence, in areas now free of dracunculiasis 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, recording (by village, district/region and date) and investigations in Level 3 areas as 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 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 *medinensis* or another species. If an

Table 9

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

\* 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 senior 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 DONATIONS MATCHED BY GATES GRANT

Late in 2009, The Carter Center received four more major donations for Guinea worm eradication in response to the challenge 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 (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				

## **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.



