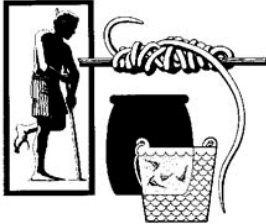


Memorandum



Date: August 29, 2018

From: WHO Collaborating Center for Dracunculiasis Eradication, CDC

Subject: GUINEA WORM WRAP-UP #256

To: Addressees

“I know from my own experience in politics that with buy-in from highest levels, anything is possible. Without it, progress is difficult.”

WHO Director-General Dr. Tedros Adhanom Ghebreyesus,
at Opening Ceremony of 71st World Health Assembly, 21 May 2018

SOUTH SUDAN FINDS MORE CASES!



After 19 consecutive months with no reported cases, three new confirmed cases of Guinea worm disease were discovered in late May and early June 2018 in 14, 17, and 25-year old Dinka cattle keepers in former Rumbek County of Lakes State (Table 1). None of the patients, who belong to highly migratory communities, was contained. The discovery came two months after South Sudan Minister of Health the Honorable Dr. Riek Gai Kok announced to an ecstatic audience during a press conference at The Carter Center in March that South Sudan had successfully interrupted transmission of Guinea worm disease, saying “This is a massive achievement for our young nation....” (see issue #254). Following laboratory confirmation of the new cases, the minister issued a statement expressing his regret at the news and reiterated “the commitment of the Government of the Republic of South Sudan to eliminate [Guinea worm disease] in South Sudan, as early as possible.” The minister noted that the disappointing discovery nonetheless demonstrated the strength and effectiveness of the country’s surveillance system and of the South Sudan Guinea Worm Eradication Program (SSGWEP), observing that he himself had visited five communities in (new) Western Lakes State (part of former Lakes State) in May to help intensify awareness of the cash reward for reporting of cases in villages and cattle camp populations.

The affected area of Western Lakes State has experienced chronic communal violence and population displacements in recent years, according to SSGWEP Director Samuel Makoy Yibi, due to increased militancy among youths in the shared cattle camps. After the government forcefully disarmed the population this year, order was restored, allowing staff of the SSGWEP to re-establish operations. The program had detected a single case in this area in 2014 and again in 2015. Only two cases were reported in the entire state in 2015 before the recent cases were discovered in 2018.

The minister, Undersecretary Dr. Makur Matur Kariom, and SSGWEP Director Makoy visited the endemic counties of Western Lakes State on July 26-27 as part of the government’s aggressive

response, which includes deployment of SSGWEP staff, re-engagement of former village volunteers and area supervisors, engagement of cattle camp field officers to move with the cattle camp groups, and other actions to increase reward awareness. The cash reward for reporting a human case of Guinea worm disease in South Sudan (and Ethiopia) is now equivalent to approximately US\$400.

Following confirmation of the three cases, two cash reward events were held in Western Lakes State in August 2018 to raise awareness about the cash reward and the importance of reporting and containing cases as well as to share the “It Pays to Report Guinea Worm” campaign messages and materials. The events were held in Meen on the 2nd of August (5,250 attendees) and Cueicok on 3rd of August (5,100 attendees). The agenda for both events included the remarks by the Hon. National Minister of Health, Dr. Riek Gai Kok; H.E. the Governor of Western Lakes State, Major General Matur Chut, Hon. Members of National Parliament, Western Lakes State Minister of Health, Under Secretary of Health in the National Ministry of Health Dr. Makur Kariom, SSGWEP Director, Makoy Samuel, WHO Country Representative Evans Lyosi, UNICEF representative, and The Carter Center Country Representative Ms. Sarah Yerian. The Hon. National Minister of Health led the cash reward ceremonies as part of each event, and cash rewards were given to three patients (with confirmed GW infections) and their respective informers from Rumbek North and Rumbek Center Counties. The events also included a performance of the “It Pays to Report Guinea Worm” social drama, local performances by the communities, and a local musician.

On August 1st, a 13-year old Nuer boy with apparent emerging Guinea worm was detected in Newland village of Ayod County in former Jongoli State (current Fangak State). The boy was diagnosed and treated after walking about 2 kilometers (~1.2 miles) to a primary health care center (PHCC), reportedly entering water sources along the way. His worm emerged on July 14. This area also has experienced population displacements due to political violence for several months. The patient is being monitored by a former SSGWEP staff from the NGO Action Against Hunger and by a former Trachoma Control Program staff member who is a clinical officer at the PHCC. The worm will be sent to CDC to confirm the diagnosis once it has fully emerged. Another suspect case is being monitored and four additional rumors in an area about 40 kilometers away are being investigated. Jongoli State reported its last known cases in 2013.



Dr. Andrew Seidu Korkor of WHO Regional Office for Africa visited Juba, South Sudan from 22 – 23 August 2018. During the mission, he participated in a workshop attended by members of The National Certification Commission (NCC) of South Sudan GWEP (SSGWEP) and National Secretariat of SSGWEP, and gave orientation on the statutory requirements for certification, the roles of the International Commission for Dracunculiasis Eradication (ICCDE), the International Certification Team (ICT) and National Certification Committee. Mr. Evans Liyosi, Acting WHO Country Representative, Dr. Luka Tombekana Monoja, Chairman of SSGWEP NCC, and his deputy, Hon. Dr. Margaret Itto Leonardo, as well as Mr. Makoy Samuel Yibi, Director SSGWEP were in attendance. Dr. Andrew Seidu Korkor, later had a work session with members of the National GWEP Secretariat and surveillance data/information management staff from the Ministry of Health and WHO, to discuss data management issues, especially as it relates to proper documentation for eventual certification.

Table 1

SSGWEP LINE LISTING OF CONFIRMED CASES: 2018

Case #	Age	Sex	Ethnicity	Village/Locality of Detection					Date GW emerged (D/M/Y)	Case contained? (Yes/No)	Patient contaminated sources of water (Yes/No)	Date ABATE applied (D/M/Y)	Source ^a of infection established? (Yes/No)
				Name	GPS Coordinates	Payam	County	State					
					Latitude	Longitude							
1	25	M	DINKA	WAR MAKOI	6.83278	29.47750	MAYOM	RUMBEK CENTER	WESTERN LAKES	NO	LATE DETECTION AND BANDAGING	UNSAFE WATER SOURCES DRY AT THE TIME OF DETECTION BUT LATER TREATED WITH ABATE ON 20/07/18	NO
2	17	F	DINKA	MALEK	7.20694	29.75444	MALEK	RUMBEK CENTER	WESTERN LAKES	NO	LATE DETECTION, LATE BANDAGING, PROBABLE CONTAMINATION OF WATER SOURCE	29/05/18	NO
3	14	F	DINKA	ANYAN-YOM	7.35027	29.68333	MAYEN (MEEN)	RUMBEK NORTH	WESTERN LAKES	NO	PROBABLE CONTAMINATION OF WATER	07/06/18	NO

ETHIOPIA: NO CASES; ELEVEN ANIMAL INFECTIONS

The Ethiopia Dracunculiasis Eradication Program (EDEP) has reported 8 domestic dogs (4 contained) with Guinea worm infections, 3 infected domestic cats (one contained), and no infected humans or baboons in January-July 2018. A line-list of the infected dogs was included in the previous issue (#255). The three infected cats were found in Pugnido Refugee Camp, two in June and one in July. All infections were found in Gog district of Gambella Region. This compares to 8 infected dogs, 4 infected baboons, and no infected humans or cats reported in January-July 2017. All of Ethiopia's human cases in 2017 were part of an outbreak during September-December in Abobo and Anfilo districts of Oromia Region. (Studies by Dr. Elizabeth Thiele at Vassar College have confirmed that all of the Guinea worms from those human cases in Ethiopia in 2017 were genetically very similar, as expected in an outbreak from a single point source of infection.) The peak season for animal infections in Ethiopia is June-September. As of June this year Abate had been applied to 2,032 ponds in 59 localities, mostly in Gog district. Intensified interventions in Gog district appear to have successfully suppressed Guinea worm infections there among humans (no cases in 2017 or so far in 2018), but not yet in dogs.

From June 5-12, a team from the Ethiopia Public Health Institute (EPHI) and The Carter Center and WHO/Ethiopia attended a meeting of Guinea worm officers and visited some of the at-risk commercial farms of concern since last year's outbreak in Abobo and Gog districts and also made a supervisory visit to some villages of Anfilo district in Oromia Region.

A joint monitoring team from EPHI led by the Deputy Director General Dr. Beyene Moges, and comprising staff from Gambella regional health bureau, WHO and The Carter Center paid a visit in Gambella region from June 19-22, 2018 to support and monitor the response and interventions to animal infections with GW in Gog Woreda, particularly the containment of transmission and the status of expansion of Abate application. Based on the joint monitoring, feedback was provided to the concerned stakeholders.

An additional Joint Technical Mission was also conducted from 25-29 June 2018 to support pre-certification activities in Mekele region. EPHI, WHO, The Carter Center and Tigray regional health bureau were involved. The pre-certification assessment report with recommendations was shared with the concerned stakeholders.

A team of scientists from Ethiopia, the United States, and the United Kingdom continued field studies and tracking of olive baboons in Gog district from June 24 to July 28. Mr. Adam Weiss from Carter Center headquarters conducted a supervisory visit to Abobo, Gog and Anfilo districts from July 15-28.

CHAD REPORTS 7 CASES; 832 INFECTED DOGS, 17 CATS



Chad has reported 832 infected domestic dogs (664, 80% contained), 17 infected domestic cats (9, 53%) contained, and 7 cases of Guinea worm disease (4, 57%) contained in January-July 2018. This compares to 637 infected dogs (78% contained), 8 cats, and 10 human cases (8 contained) during the same period of 2017; January to July 2018 has seen a 31% increase in infected dogs (Figure 1) and a 30%

Figure 1

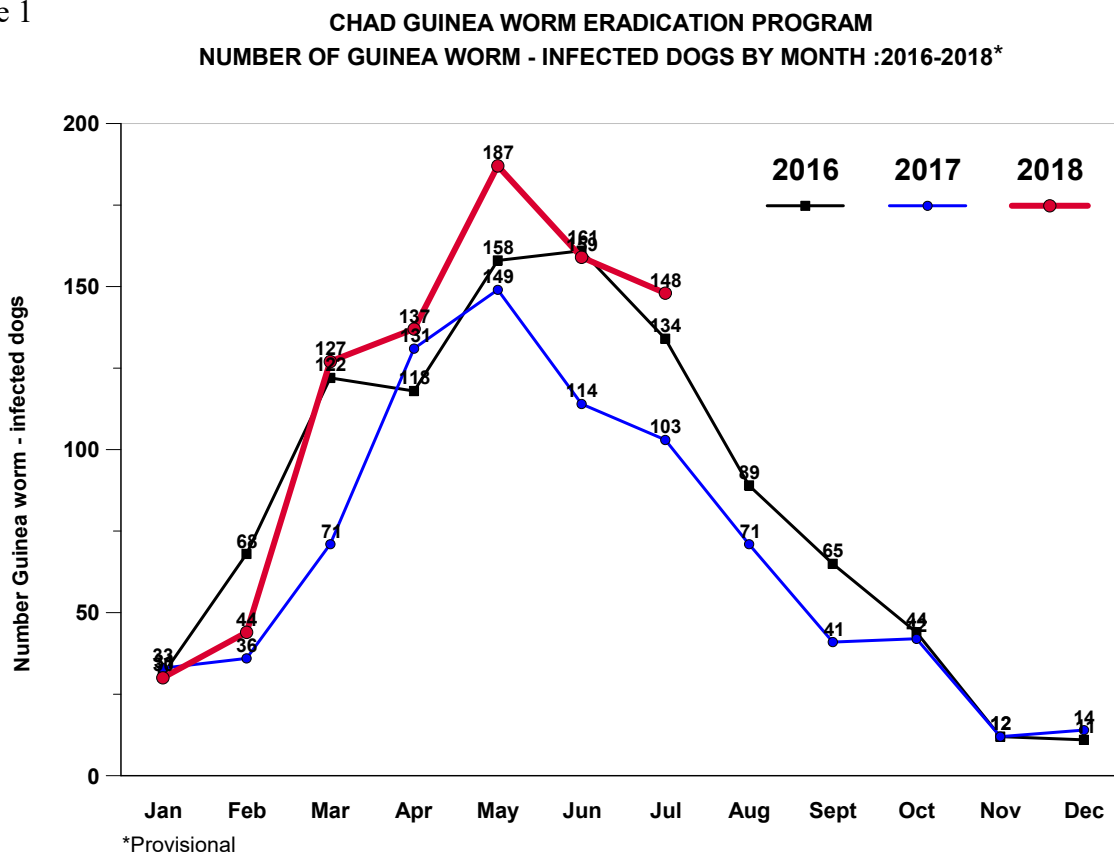
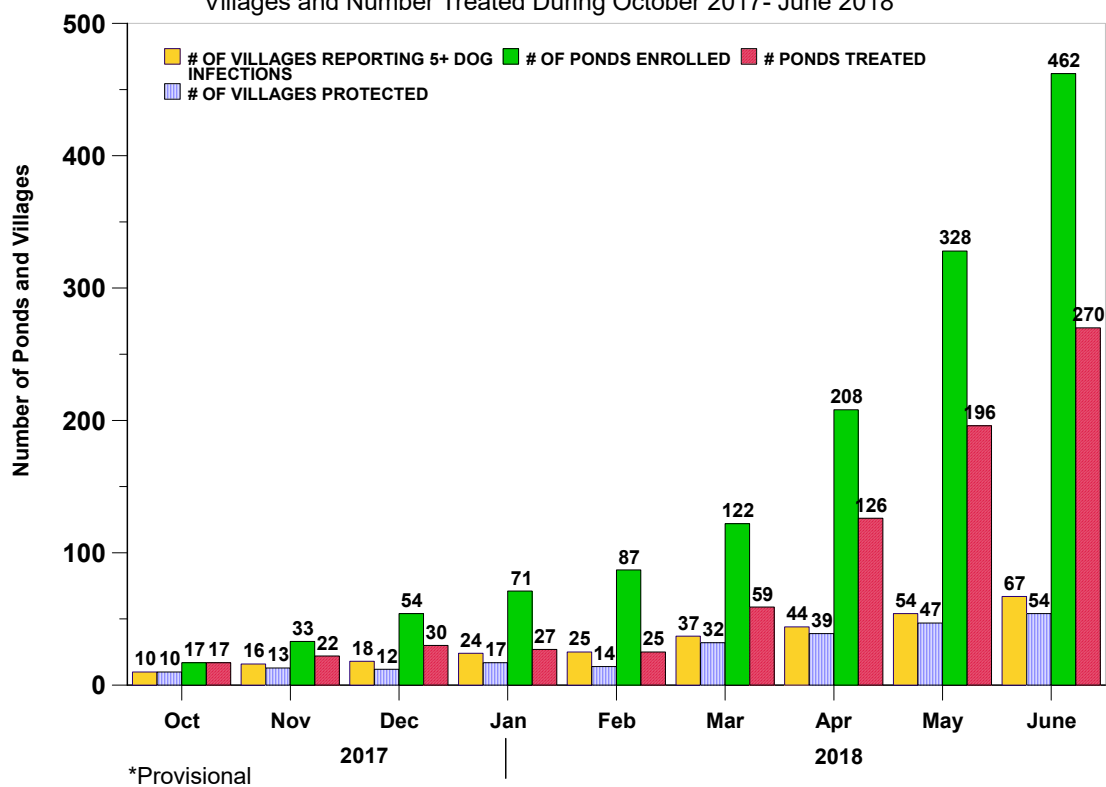


Figure 2

Chad Guinea Worm Eradication Program
Number of Villages Reporting 5 or More Dog Infections During 2017 and/or 2018, and Number Protected by Monthly ABATE Treatments to Ponds 1,000 Cubic Meters or Less: Number of Ponds in Villages and Number Treated During October 2017- June 2018*



decrease in human cases (Table 2). As of June 2018, the program had received 5,668 rumors of possible dog GW infections, while 243 villages had reported at least one infection so far this year, including 56 villages that reported dog infections for the first time. Chad's GWEP continues to increase monthly applications of Abate (Figure 2), giving priority to villages with the most infected dogs. In total 84% of 975 households surveyed in June in villages with infected animals or humans were practicing safe disposal of fish guts. National Program Coordinator Dr. Tchindebet Ouakou supervised field activities between June 20 and July 4 in Danamadji and Kouno districts. Carter Center Country Representative Dr. Hubert Zirimwabagabo supervised field activities on June 24-28 in Bousso and Bailli districts. Researchers from Exeter University (UK) resumed in-country activities in mid-July and will be joined by other colleagues from August 29 to September 3rd.

MALI: NO HUMAN CASES; EIGHT ANIMAL INFECTIONS

Mali's Guinea Worm Eradication Program (GWEP) has reported 6 infected dogs (3 contained), 2 infected cats (0 contained), and no human case of Guinea worm disease in January-July 2018 (Table 3). This compares to 3 infected dogs, no infected cat and no human case during January-July 2017. Mali reported a total of 9 infected dogs and 1 infected cat in all of 2017 and 11 infected dogs in 2016. All of the infected animals this year have been found in Segou Region. Insecurity continues to limit supervision and other program operations in parts of adjacent Mopti Region where dogs are bred and apparently become infected before being transported to Segou and sold there. As of the end of July the GWEP had 882 villages under active surveillance and received 133 rumors of Guinea worm cases in humans. Mali's GWEP has successfully stopped transmission of Guinea worm disease to humans in 2016, 2017, and so far in 2018 but the main transmission season in Mali is July-December. Elimination of the infections in dogs will require better security and access in parts of Mopti Region.

Data manager Mr. Traore of the national program made a supervisory visit to Tominian, San and Markala districts of Segou Region in June. The Ministry of Public Health appointed a new National Program Coordinator for the GWEP, Dr. Cheick Oumar Coulibaly, MD, MPH in July. He replaces the previous National Program Coordinator Dr. Mohamed Berthe, who is now an advisor to the Minister of Health.

WHO plans to conduct an in-country external evaluation of Mali's GWEP on September 2-20 at the request of the Ministry of Public Health.

A CASE OF GWD IN ANGOLA

The surprising discovery of an Angolan 8 year old girl with an emerging worm in Cunene Province in south-central Angola near the border with Namibia occurred thanks in part to an alert pharmacy owner and health worker who had just been taught about Guinea worm disease by the Ministry of Health as part of a national immunization campaign. The house where the patient lives is immediately adjacent to the pharmacy. The attending pharmacist was informed of the patient's condition as the family interacts with the pharmacy almost daily. The pharmacist examined the patient and then reported the condition to the pharmacy owner. The owner is a health worker and

Table 2

CHAD GUINEA WORM ERADICATION PROGRAM GWEP LINE LISTING OF CASES: YEAR 2018*

Case #	Age	Sex	Ethnicity	Village/Locality of Detection			Date GW emerged (D/M/Y)	Case contained? (Yes/No/)	Patient contaminated sources	Date ABATE applied (D/M/Y)	Source* of infection establish	Worm Specimen	
				Village	District/ payam/ worda	County/ Region						Date sent to CDC	Date CDC Diagnosis
1	22	F	Sara Kaba	Madjiyam	Kyabe	Marabe	01/27/18	Yes	No	N/A	No	01/30/18	02/15/18
2	25	F	Sara Kaba	Dangala Kanya	Kyabe	Marabe	02/19/18	Yes	No	N/A	No	03/02/18	03/26/18
3	50	M	Djam	Guelbodane	Niellim	Korbol	03/19/18	Yes	No	N/A	No	03/22/18	04/13/18
4	25	F	Rachide	Am-Habile	Aboudeia	Salamat	07/01/18	No	No	N/A	No	07/09/18	07/23/18
5	45	F	Foulata	Am-Dabri	Amtiman	Salamat	07/05/18	Yes	No	N/A	No	07/09/18	07/23/18
6	20	F	Rachide	Am-Habile	Aboudeia	Salamat	07/18/18	No	No	N/A	No	07/28/18	08/09/18
7	56	M		Djoballa 4	Bouso	Chari Baguirmi	07/02/18	No	Yes		No	07/09/18	08/15/18

Table 3

MALI GWEP LISTING OF DOG INFECTIONS: 2018*

Animal Serial No.	Region	District	Health Area	Village	GPS (N)	GPS (E)	Ethnicity of Animal Owner	Occupation of Animal Owner	No. of GWs	Animal	Containment (Yes/No)	Date of detection	Date GW emergence	Water Source Contamination ? (Yes/No/likely)	Abate applied (Yes/No)	Ver isolate^ (Oui/Non)	Lab Confirmed
1	Segou	Tomini	Fangasso	Tierakuy	13.24705	-4.20685	Bobo	farming	2	dog	Yes	16-May-18	16-May-18	No	No	Yes	Yes
2	Segou	Tomini	Togo	Matina	13.62879	-4.43932	Bobo	farming	1	dog	Yes	9-Jun-18	10-Jun-18	No	No	Yes	Yes
3	Segou	Markala	Babougou	Barakabougou	13.79163	-5.73397	Bozo	Fishing	2	dog	No	26-Jun-18	26-Jun-18	Likely	Yes	No	Yes
4	Segou	Macina	Central	Gueda	13.94091	-5.41627	Bambara	farming	1	dog	No	12-Jul-18	12-Jul-18	Likely	Yes	No	Yes
5	Segou	Macina	Central	Gueda	13.94091	-5.41627	Bozo	fishing/farming	1	dog	No	11-Jul-18	9-Jul-18	Yes	Yes	No	Yes
6	Segou	Tomini	Ouan	Ouena	13.39015	-4.26455	Bobo	housewife	1	cat	No	27-Jul-18	27-Jul-18	Likely	Yes	No	Yes
7	Segou	Tomini	Fangasso	Soumankuy	13.33701	-4.29919	Bobo	farming	1	dog	Yes	14-Jul-18	14-Jul-18	Likely	Yes	Yes	pending
8	Segou	Tomini	Fangasso	Mampe	13.35631	-4.25403	Bobo	farming	1	cat	No	27-Jul-18	15-Aug-18	Likely	Yes	No	pending

*Provisional

^ All of the containment criteria must be met:

1. The animal must be detected and tethered within 24 hours of worm emergence.
2. The animal must not have entered a source of water with an emergent GW.
3. The animal is tethered prior to GW emergence until all worms are extracted, and owners received health education.
4. A supervisor confirms the infection with GW within 7 days of worm emergence.
5. Abate is applied to water sources to prevent the possibility of transmission of GWs within 15 days of the contamination event.

Table 4

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2018*
(Countries arranged in descending order of cases in 2017)

COUNTRIES WITH TRANSMISSION OF GUINEA WORMS	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED												% CONT.
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL*
CHAD	1 / 1	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0	1 / 4	/	/	/	/	/	4 / 7
ETHIOPIA	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	/	/	/	/	/	0 / 0
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 2	0 / 0	/	/	/	/	/	0 / 3
MALI §	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	/	/	/	/	/	0 / 0
ANGOLA^	/	/	/	0 / 1	/	/	/	/	/	/	/	/	0 / 1
TOTAL*	1 / 1	1 / 1	1 / 1	0 / 1	0 / 1	0 / 2	1 / 4	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	4 / 11
% CONTAINED	100%	100%	100%	0%	0%	0%	400%						36%

*Provisional

Cells shaded in black denote months when zero indigenous cases were reported. Numbers indicate how many cases were contained and reported that month.

Shaded cells denote months when one or more cases of GWD did not meet all case containment standards.

§Reports include Kayes, Koulikoro, Segou, Sikasso, and Mopti, Timbuktu and Gao Regions; contingent on security conditions during 2018, the GWEP continued to deploy one technical advisor to Kidal Region to oversee the program.

^ Investigation of the origin of this case is ongoing. Preliminary outcomes indicate there is no current or historical evidence of human or animal infections in the district of residence.

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2017*
(Countries arranged in descending order of cases in 2016)

COUNTRIES WITH ENDEMIC TRANSMISSION	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED												% CONT.
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL*
CHAD	0 / 0	1 / 1	1 / 1	1 / 2	2 / 2	1 / 2	2 / 2	0 / 1	0 / 2	1 / 1	0 / 0	1 / 1	10 / 15
SOUTH SUDAN	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
ETHIOPIA ^	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 8	0 / 4	1 / 2	0 / 1	3 / 15
MALI §	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	1 / 1	1 / 1	1 / 2	2 / 2	1 / 2	2 / 2	0 / 1	2 / 10	1 / 5	0 / 0	1 / 2	13 / 30
% CONTAINED	0%	100%	100%	50%	100%	50%	100%	0%	20%	20%	0%	50%	43%

*Provisional

Cells shaded in black denote months when zero indigenous cases were reported. Numbers indicate how many cases were contained and reported that month.

Shaded cells denote months when one or more cases of GWD did not meet all case containment standards.

^ 10 of 12 cases laboratory confirmed; 2 of 12 declared cases based on where and when these became infected in 2016, and having had signs and symptoms of GWD at the same time as others.

§Reports include Kayes, Koulikoro, Segou, Sikasso, and Mopti, Timbuktu and Gao Regions; contingent on security conditions during 2017, the GWEP continued to deploy one technical advisor to Kidal Region to oversee the program.

happened to have received training by the MOH on GWD a few days earlier, which is why he was aware they needed to preserve the specimen. Guinea worm case searches were being conducted as part of Angola's documentation to support its request to the World Health Organization (WHO) for certification of Guinea worm-free status. According to WHO, the girl was detected in the village of Oluxua in April 2018 during a national immunization campaign against measles, rubella, and polio. She had a hanging worm when detected so her infection was not contained. She was admitted to a health center on May 14 and the worm specimen was sent to the Ministry of Health and received by WHO offices in Luanda on May 30 and sent to the Centers for Disease Control and Prevention (CDC) in Atlanta that same day. The worm specimen was received by CDC on June 8, for morphological examination, which was inconclusive regarding whether or not it was *Dracunculus medinensis*, and requiring molecular testing for *D. medinensis* DNA via polymerase chain reaction (PCR). CDC confirmed the diagnosis of *D. medinensis* by PCR testing of the worm's DNA sequences on June 27. This patient has no history of travel outside of her home village and immediate area of Angola, her village is over a thousand miles (~1,700 km) from the nearest known cases of Guinea worm disease, and no other recent or historical cases were found during the investigation by ministry of health authorities assisted by the local office of WHO. The ministry of health conducted a follow up investigation on June 29.

No case of Guinea worm disease has ever been reported from Angola historically, including during colonial times, and no case is known or alleged to have been imported from Angola to Brazil, Cuba, Portugal or any other country, including during the Atlantic Slave Trade. An urgent review of the medical literature and colonial era records in Angola, Portugal, Brazil and Cuba seems in order given the seriousness of this situation. Only one other species of *Dracunculus* besides *D. medinensis* has been reported from Africa: Ralph Muller (*Dracunculus* and *Dracunculiasis*, pp.97-98) lists "*D. dahomensis*" reported from a python in Dahomey in 1895 and from Congo in 1937.

A team of 6 International experts began an investigation of this case in the field on August 14, 2018 at the invitation of the Ministry of Health of Angola. The team is led by Dr. Andrew Seidu Korkor of WHO/AFRO (former national coordinator of Ghana's GWEP) and included Mr. Adam Weiss of The Carter Center; the national GWEP coordinators of Cote d'Ivoire (Koffi Kouame), Niger (Boulama Ousmane), and Togo (Dr. Koffi Otogbe); and former national GWEP coordinator Dr. Issa Degoga of Mali.

WORLD HEALTH ORGANIZATION



The WHO organized the third biennial review meeting of countries in Post-certification phase of Guinea worm eradication from 24 – 25 July 2018 in Ouagadougou, Burkina Faso. The meeting, which brought together about 30 participants from Benin, Burkina Faso, Cameroon, Ivory Coast, Ghana, Kenya, Mauritania, Niger, Nigeria, Uganda, Senegal and Togo, was facilitated by Dr. Andrew Seidu Korkor focal point for Guinea worm eradication (GWE) in the WHO regional office for Africa, and Dr. Dieudonne Sankara, Team Leader for GWE in WHO. The opening ceremony was performed by Dr. Mete Bonkougou, Technical Advisor of the Minister of Health on behalf of the Minister of Health of Burkina Faso and Dr. Alimata Diarra Nama, Representative of the WHO in Burkina Faso. During the two-day long meeting, the delegates reviewed post-certification

surveillance activities in all the countries, challenges and emerging issues, comprising reinforcing and expanding the surveillance among animals, and discussed opportunities and proposed plans for continuing and strengthening surveillance in certified countries, including cross-border surveillance in the West, Central and Eastern Africa clusters.

Further to continued efforts by WHO to strengthen cross-border surveillance between Chad and high-risk districts in neighbouring Cameroon and Central African Republic, the WHO organized an international cross-border meeting from 15-16 August 2018 in N'Djamena, Chad to strengthen the capacity of front-line health workers to respond quickly to rumors of possible Guinea worm infections in their respective districts and across their common borders. The opening ceremony was performed by Dr. Wadak Nour Technical Advisor of the Minister of Health on behalf of the Minister of Health of Chad, and Dr. Jean-Bosco NDIHOKUBWAYO, Representative of the WHO in Chad. The meeting convened about 80 delegates from 21 districts in Chad, Cameroon and Central African Republic led by their respective GWE National Coordinator, Regional Directors for Health and WHO country office focal point for GWE. The meeting was facilitated by Dr. Dieudonne Sankara of WHO/HQ and Dr. Zeyede Zeleke Kebede of WHO Ethiopia and also attended by Dr. Hubert Zirimwabagabo, the Carter Center Representative in Chad as well as many Carter Center Technical Advisors. Specific district Guinea worm surveillance action plans were developed, follow up is being conducted to ensure roll out and further strengthening of GW surveillance at the border areas of the 3 countries.

NEW GUINEA WORM WARRIORS



The Carter Center is pleased to announce the appointment of Dr. Sarah A. Guagliardo, who joined the Guinea Worm Eradication Program in late June. After graduating with high honors from The George Washington University, she was a U.S. Peace Corps health volunteer for two years in Honduras. An epidemiologist, Dr. Guagliardo holds a PhD in Population Biology, Ecology and Evolution from Emory University, and a Master's in Public Health from Yale University. Her graduate theses at those institutions focused on aspects of *Aedes aegypti* distribution in the Peruvian Amazon and in Andean cities of Venezuela. While serving as an Epidemic Intelligence Service officer at the Centers for Disease Control and Prevention (CDC), she conducted epidemiologic investigations of risk factors and surveillance for monkeypox in Cameroon and the Democratic Republic of Congo, as well as other investigations related to rabies, leptospirosis and other problems. At The Carter Center she will help provide epidemiologic analyses and other technical assistance to national Guinea Worm Eradication Programs. Welcome Dr. Guagliardo!!!

We are also pleased to announce the appointment of Ms. Karmen Unterwagner as Associate Director of The Carter Center's GWEP, who reported on duty on August 20, 2018. Karmen holds an MPH degree from the Rollins School of Public Health at Emory University and a Bachelors in Architecture from the University of Oregon at Eugene, Oregon. She was a former US Peace Corps Volunteer in Mali during 2008-2012, and a Carter Center Technical Advisor to Chad's GWEP during 2013-2015. Welcome Karmen!

DR. GABISIU AYODELE WILLIAMS, (1937-2018)



We report with profound sadness the passing on July 27, 2018 of Dr. Gabi Williams, former Medical and Chief Health Officer of Lagos State, Nigeria and former Director of Disease Control and International Health in Nigeria's Federal Ministry of Health. In the latter role, with his esteemed Minister the late Professor Dr. Ransome Kuti, Dr. Williams was a key force in launching and sustaining Nigeria's National Guinea Worm Eradication Program (NIGEP) with assistance of The Carter Center, starting in 1988. In addition to supporting Nigeria's own program, which was under his direct supervision, he was an unfailing and influential partner in advocating strongly for Guinea worm eradication during annual meetings of the World Health Assembly in Geneva and in other fora at a time when Guinea worm eradication was unpopular, even before Nigeria began its program. With his support, Nigeria was one of seven co-sponsors of the first World Health Assembly resolution on the global "elimination" of Guinea worm disease, in 1986. Dr. Williams later represented Nigeria on the Executive Board of WHO and at UNICEF. On the occasion of his 80th birthday in September 2017, his family launched the Gabi Williams Alzheimer's Disease Foundation in Lagos. The inaugural keynote lecture was given by his son, Prof. Jide Williams, Professor of Neurology at Columbia University Medical Center, New York.

DR. ERNESTO RUIZ-TIBEN, MIGHTY GUINEA WORM WARRIOR, RETIRES



Dr. Ernesto Ruiz-Tiben, the indefatigable Director of The Carter Center's Guinea Worm Eradication Program for the past twenty years, since 1998, has decided to retire as of August 31, 2018. A graduate (Bachelor of Science) of the Catholic University of Puerto Rico, Dr. Ruiz also earned a Master of Science degree from the University of Puerto Rico School of Public Health, and a PhD in epidemiology from the University of Texas School of Public Health at Houston. Dr. Ruiz joined The Carter Center in 1992 after more than 27 years as a commissioned officer in the U.S Public Health Service at the Centers for Disease Control and Prevention, where he worked on dengue fever and schistosomiasis, in Puerto Rico, Liberia, the Dominican Republic, Suriname, Brazil, Egypt and elsewhere. He was assigned to work on the Guinea worm eradication initiative at CDC in 1981, less than a year after it began, and helped develop the original eradication strategy, training materials, and other seminal publications. He and Dr. Barney Cline of CDC provided the first consultation to the Ministry of Health of Pakistan in December 1986 as part of The Carter Center's inaugural assistance to a national Guinea Worm Eradication Program.

During his first six years working on Guinea worm eradication full time at The Carter Center with then-program director Dr. Donald Hopkins, they managed the Center's earliest assistance to the new programs in Pakistan, Ghana, Nigeria and Uganda. Direct support for other Guinea worm programs followed quickly, notably Mali, Niger and Sudan/South Sudan. Dr. Ruiz succeeded Dr. Hopkins as director in 1998, overseeing direct assistance to more than a dozen endemic countries with in-country representatives from The Carter Center, providing technical advice, funding, donated filter material and Abate, and logistical support. Over the years, he and his staff recruited, trained, and supervised scores of consultants and technical advisors to national Guinea Worm Eradication Programs and helped prepare numerous grant proposals. He personally contributed innovative solutions to problems, such as the "Ernesto filter" design to conserve expensive nylon filter material, developing new ways of presenting and analyzing program data, and creative operational research. On innumerable supervisory trips to endemic countries, with and without former U.S. President Jimmy Carter, he inspired national and international workers in the field as well as ministry officials, sometimes prodding the higher-ups.

Dr. Ruiz's day-to-day presence will be greatly missed by his fellow Guinea Worm Warriors, but we shall still seek his insights, institutional memory and wise counsel, while allowing him and his family to enjoy a well-deserved rest. Thank you, Ernesto! We look forward to toasting the "demise of the worm" with you soon!! ONWARD!!

RECENT PUBLICATIONS

Bhatnagar P, 2018. Calcified Guinea worm in broad ligament in tribal ladies in south Rajasthan: case report on three cases. Indian Obstetrics & Gynaecology [serial online] 8:39-41.

Galan-Puchades MT, 2017. WHO delays guinea-worm disease eradication to 2020: are dogs the sole culprits? The Lancet. Infectious Diseases 17:1124-1125.

Hopkins DR, Ruiz-Tiben E, Eberhard ML, Weiss A, Withers PC Jr, Roy SL, Sienko DG, 2018. Dracunculiasis eradication: are we there yet? Am J Trop Med Hyg 99:388-395.
<https://doi.org/10.4269/ajtmh.18-0204>

Loslo A, Mushayabasha S, 2018. Modeling the effects of spatial heterogeneity and seasonality on Guinea worm disease transmission. J Applied Mathematics [serial online] July 5:1-12.

McNeil DG Jr, 2018. Old terror turns to dogs. New York Times [serial online] June 19:D1, D5.

World Health Organization, 2018. Monthly report on dracunculiasis cases, January-April 2018. Wkly Epidemiol Rec 93:355-356.

Thiele EA, Eberhard ML, Cotton JA, Durrant C, Berg J, Hamm K, Ruiz-Tiben E, 2018. Population genetic analysis of Chadian Guinea worms reveals that human and non-human hosts share common parasite populations. PLoS Negl Trop Dis. <https://doi.org/10.1371/journal.pntd.0006747>

Inclusion of information in the Guinea Worm Wrap-Up
does not constitute “publication” of that information.
In memory of BOB KAISER

Note to contributors: Submit your contributions via email to Dr. Sharon Roy (gwwrapup@cdc.gov) or to Dr. Ernesto Ruiz-Tiben (eruizti@emory.edu), by the end of the month for publication in the following month's issue. Contributors to this issue were: the national Guinea Worm Eradication Programs, Drs. Donald R. Hopkins and Ernesto Ruiz-Tiben of The Carter Center, Dr. Sharon Roy of CDC, and Dr. Dieudonné Sankara of WHO.

WHO Collaborating Center for Dracunculiasis Eradication, Center for Global Health, Centers for Disease Control and Prevention, Mailstop A-06, 1600 Clifton Road NE, Atlanta, GA 30329, USA, email: gwwrapup@cdc.gov, fax: 404-728-8040. The GW Wrap-Up web location is

<http://www.cdc.gov/parasites/guineaworm/publications.html#gwwp>

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



World Health
Organization

CDC is the WHO Collaborating Center for Dracunculiasis Eradication