



Date: August 24, 2020
From: WHO Collaborating Center for Dracunculiasis Eradication, CDC
Subject: GUINEA WORM WRAP-UP #270
To: Addressees

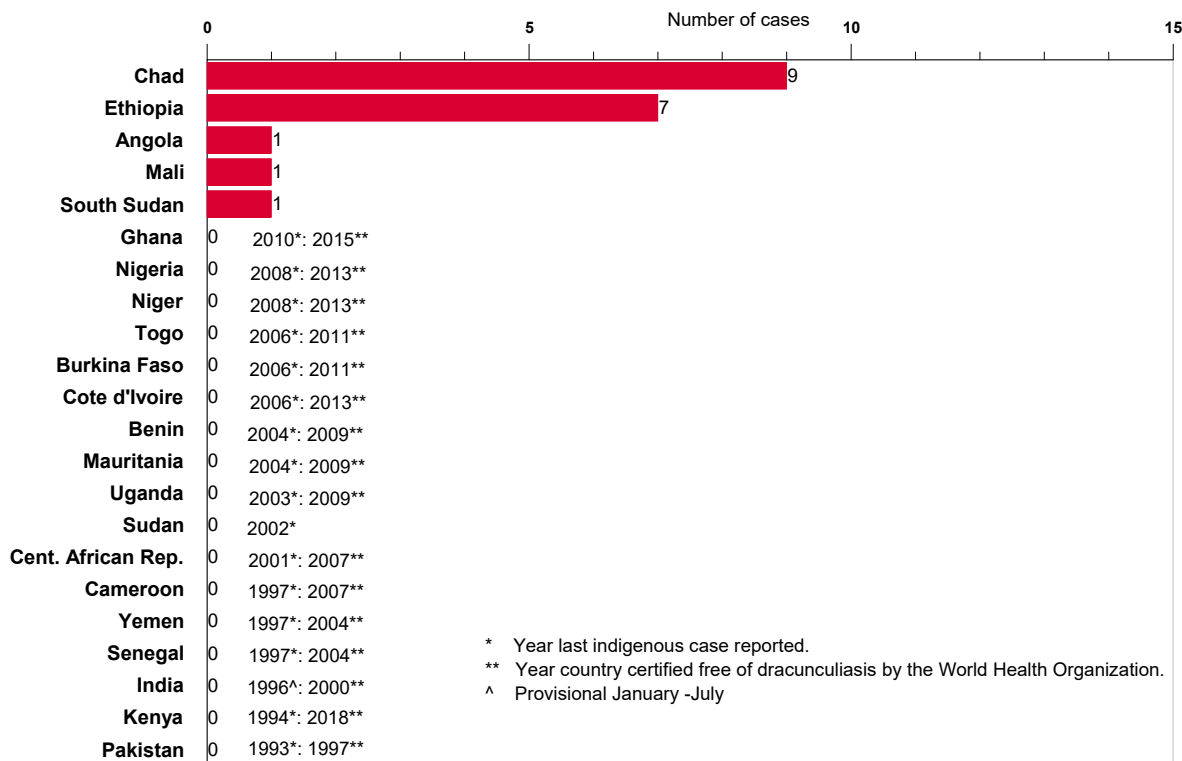
Detect and Contain Every Guinea Worm!

19 HUMAN CASES IN JANUARY-JULY 2020 VS. 40 CASES SAME TIME IN 2019

Angola, Chad, Ethiopia, Mali and South Sudan have together reported 19 indigenous human cases of Guinea worm disease in January-July 2020. This is a global reduction in human cases of 51% compared to 41 cases reported by Angola, Cameroon, Chad and South Sudan during the same period of 2019 (Ethiopia and Mali reported no human cases in 2019). The cases reported in those two years include a waterborne outbreak in Chad early in 2019 and another waterborne outbreak in Ethiopia in April 2020 (see articles below). Animal Guinea worm infections have been reduced by 25% overall in January-July 2020 (1148 dogs, 45 cats, 3 baboons) compared to the same period of 2019 (1,565 dogs, 25 cats, 6 baboons).

Figure 1

Distribution of 19 Indigenous Cases of Dracunculiasis Reported during 2020[^]



CHAD: 27% FEWER DOG INFECTIONS



Chad's Guinea Worm Eradication Program (CGWEP) continues to record impressive progress against dog infections. It has reported a provisional total of 1,143 infected dogs in January-July 2020, compared to 1,563 dog infections in January-July 2019, for a year-to-date reduction of 27% (Figure 2). Beginning in March 2020, the rate of reduction has steadily increased monthly to -24%, -33%, -42%, -40%, and -45%, compared to the same month of 2019. (The GWEP in Chad remains fully operational despite precautions taken to ensure safety of program staff and community members in response to COVID-19. Chad began these adjustments before its first COVID-19 cases were reported in early April. Ninety-nine percent of Chad's 2,226 villages under active surveillance reported in May.) Eighty-eight percent (88%) (1,037/1,181) of the animal infections (1,143 dogs, 38 cats) in January-July 2020 were contained, compared to 76% (1,514/1,982) of animal infections (1,935 dogs, 47 cats) contained in January-December 2019.

Chad also reported 9 human cases (4 contained) in January-July 2020, compared to 38 cases in the same period of 2019. One of the cases in May 2020 is an 8 year old girl at Bogam village in Aboudeia district of Salamat Region who also was infected (case #29) in the waterborne outbreak there in 2019 (Table 1).

Chad appointed a new Minister of Health on July 14, the Honorable Dr. ABDOULAYE Sabre Fadoul. Trained in public law, Dr. Abdoulaye is a former director of President Deby's cabinet office and also formerly served successively as minister of justice, minister of telecommunications, and minister of finance. On July 21 the National Program Coordinator of Chad's GWEP, Dr. TCHINDEBET Ouakou, Carter Center Country Representative Dr. Hubert Zirimwabagabo, and WHO/Chad GW Focal Point Dr. Ibrahim Djeomboro briefed the High Council of Traditional Leaders in Chad on the status of the Guinea Worm Eradication Program and the program's new initiative for proactive tethering of dogs, at the *Palais du 15 Janvier* in N'Djamena. The leaders appreciated the briefing and promised their support. The event was covered by national television and two local radio stations. With Carter Center support the CGWEP also is exploring new interventions to improve management of aquatic animal waste (e.g., fish guts) at the community level.

Figure 2

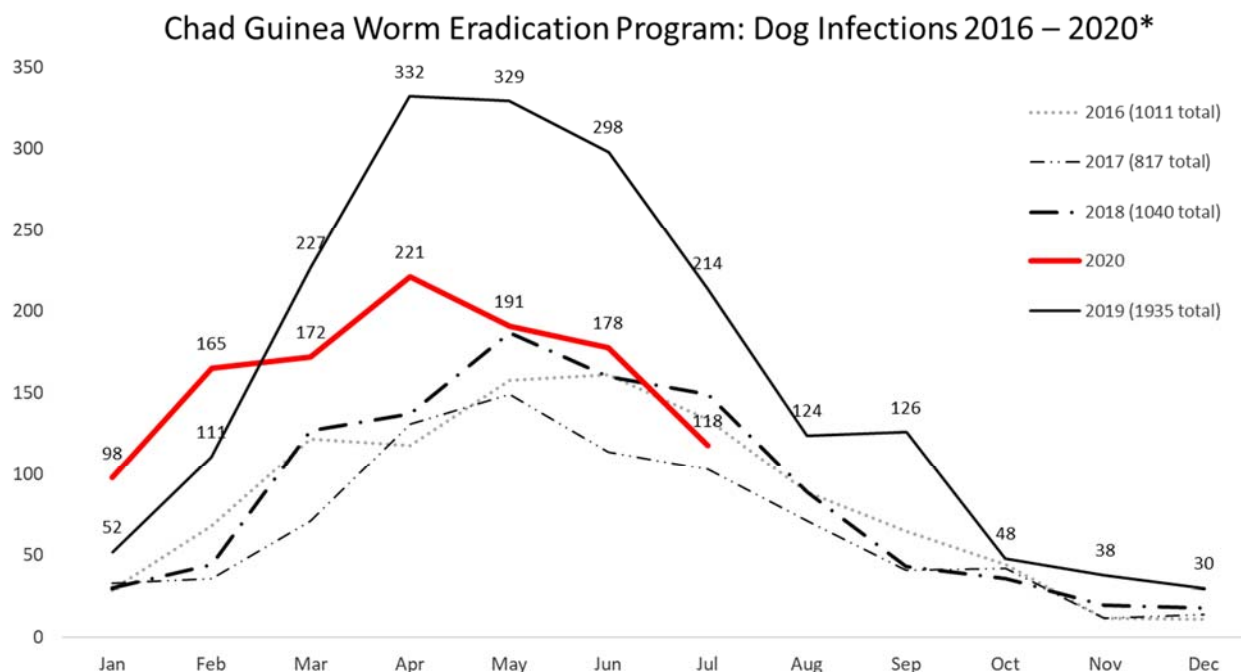


Table 1

Chad Guinea Worm Eradication Program: GWEP Line Listing of Confirmed Cases: Year 2020*

Case #	Age	Sex	Ethnicity	Occupation	Village of Detection	Zone	District	Region	Date of Detection	Date of Emergence	Contained (yes / no)	Entered water
1	32	M	Marba	Farmer	Bouar Baguirmi	Gambarou	Mandelia	Chari Baguirmi	3-Jan-20	3-Jan-20	yes	No
2	11	F	Sara Kaba	Child	Kyabe	Kyabe	Kyabe	Moyen Chari	16-Feb-20	16-Feb-20	No	No
3.1	10	M	Daye	Child	Kemkian	Kemkian	Sarh	Moyen Chari	1-Mar-20	1-Mar-20	No	Yes
3.2	10	M	Daye	Child	Kemkian	Kemkian	Sarh	Moyen Chari	1-Mar-20	1-Mar-20	No	Yes
4.1	10	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	9-Mar-20	9-Mar-20	No	No
4.2	10	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	2-May-20	21-May-20	No	-
5.1	8	M	Hadjarai	Child	Marabodokouya 1	Marabe	Kyabe	Moyen Chari	19-Mar-20	6-Apr-20	No	No
5.2	8	M	Hadjarai	Child	Marabodokouya 1	Marabe	Kyabe	Moyen Chari	6-Apr-20	6-Apr-20	No	No
5.3	8	M	Hadjarai	Child	Marabodokouya 1	Marabe	Kyabe	Moyen Chari	21-Apr-20	24-Apr-20	No	No
5.4	8	M	Hadjarai	Child	Marabodokouya 1	Marabe	Kyabe	Moyen Chari	21-Apr-20	24-Apr-20	No	No
6	6	M	Arabe	Child	Bogam	Liwi	Aboudeia	Salamat	9-May-20	9-May-20	yes	No
7	41	M	Kouffa	Pecheur	Bemadjirondjo	Kemata	Sarh	Moyen Chari	30-Apr-20	20-May-20	Yes	No
8	8	F	Arabe	Enfant	Bogam	Liwi	Aboudeia	Salamat	7-May-20	7-May-20	yes	No
9	43	F	Goulaye	Menagere	Congo Sara	Banda	Sarh	Moyen Chari	8-Mar-20	1-Mar-20	No	Yes

ETHIOPIA: ONE SUSPECT HUMAN CASE & EIGHT SUSPECT INFECTED ANIMALS

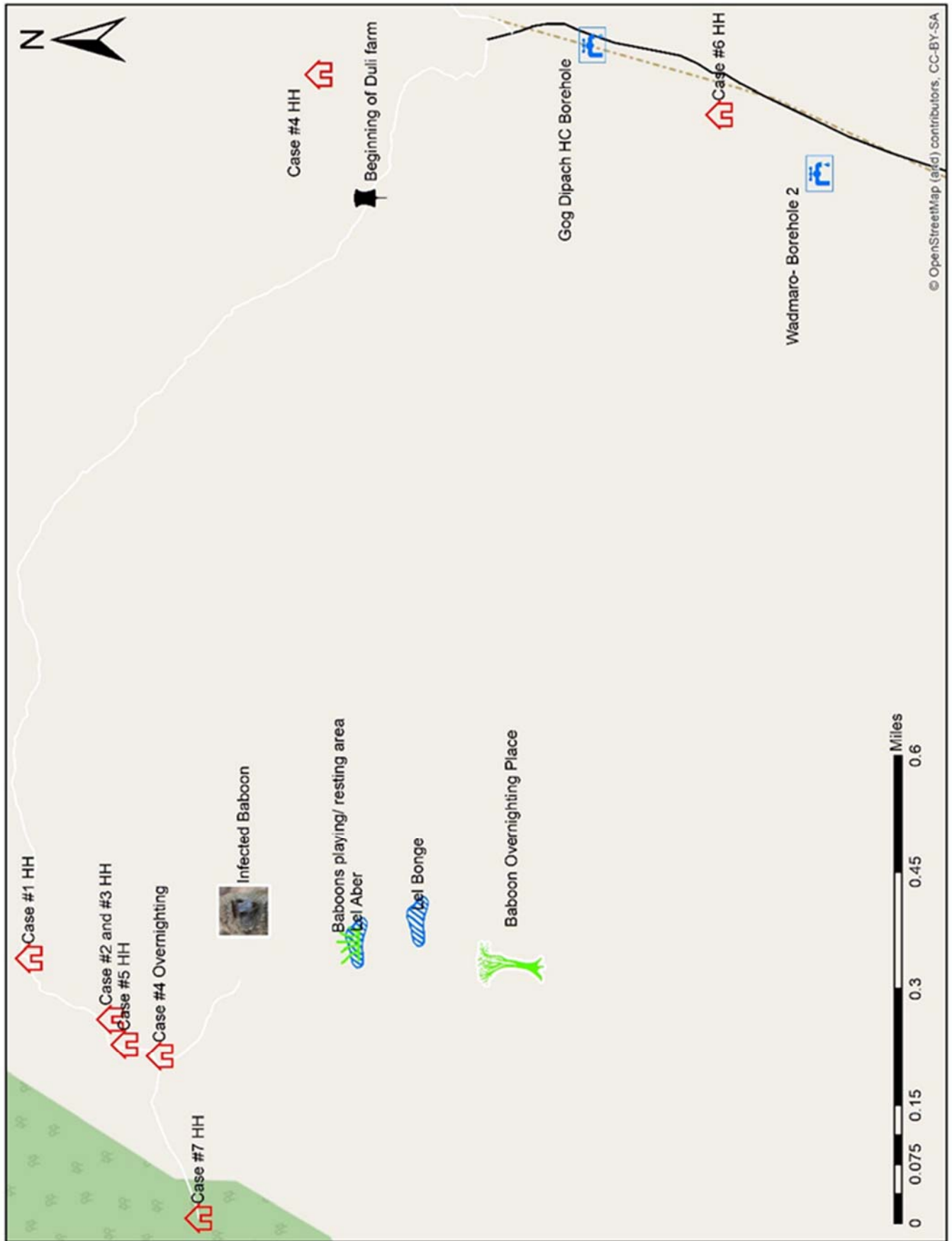


Ethiopia's Dracunculiasis Eradication Program (EDEP) is still following up the outbreak of seven confirmed human Guinea worm cases in April 2020 that resulted from exposure to a shared source of contaminated drinking water near Duli village in Gog district of Gambella Region (see *Guinea Worm Wrap-Up* #268). The infections in all seven patients were contained. Interrogation of the patients and other community members and associated investigations have led the program to believe the outbreak was caused by failure to use filters properly, using damaged filters, or not using filters at all during a single or a few instances by household members of case #3 (the village chief) and/or case #5 when they collected water from Lel Bonge pond (7.61246N, 34.43255E) in March 2019. Community members prefer collecting drinking water from Lel Bonge because the bottom is rocky and its water is clearer. The seven cases from six households have close familial and/or social relations and they shared drinking water collected by members of case #3 and case #5 households. Those two households were common hosts for social gatherings on multiple occasions. The EDEP identified and followed daily over 600 persons who also were in the Duli area for farming, hunting and other activities, some of whom also drank water from Lel Bonge, but found no other cases.

Rainfall data from the Department of Meteorology and interviews of community members suggest that the Lel Bonge pond received its first seasonal rain of 2019 in March and had water in between the scheduled Abate treatments on February 25 and March 23, 2019 which was a brief lapse that was missed by the Abate Captain. The pond was treated on April 11, 2019 and the community members were using untreated water from Lel Bonge up until then. Lel Bonge pond is shared by at least one local troop of olive baboons, including a slow-moving baboon with multiple worms that was killed on May 9, 2020 near the house of case #3 (see Figure 3). There was no known Guinea worm-infected human or dog in Duli in 2019, but a dead baboon with multiple Guinea worms was found there on June 2, 2019. The program deployed three hunter groups to assess baboon movements and search for unknown water sources in the area immediately after discovery of the first case in this outbreak and assigned a field team from the on-going Baboon Study to help them during April-June.

So far in 2020, Ethiopia has laboratory-confirmed Guinea worm infections in 7 humans, 3 baboons and 2 dogs. In addition there are provisional Guinea worm infections in 1 human, 1 dog and 7 domestic cats. The cat infections (and the provisional human case) were all detected at PRC Agnuak refugee camp in Gog district in July-August, similar to the outbreak among 5 cats there in 2018. A farmer killed the third baboon with two emerging Guinea worms at Ablen in Gog district in July. All of these confirmed and provisional human and animal infections occurred in Gog district except one of the dogs (Abobo district). All of these infections except of the baboons were contained. Follow up investigations are on-going. A line list of confirmed and pending human cases and animal infections is found in Tables 2 and 3 respectively.

Figure 3 MAP



Ethiopian Dracunculiasis Eradication Program

Table 2 Line Listing of Confirmed and Pending Cases: Year 2020*

Case #	Age	Sex	Ethnicity	Occupation	Village of Detection	Zone	District	Region	Date of Detection	Date of Emergence	Contained (Yes / No)	Entered Water	Lab. Result
1	14	F	Agnua	Student	Duli	Agnua	Gog	Gambella	29-Mar	2-Apr	Yes	No	Confirmed
2	12	F	Agnua	Student	Duli	Agnua	Gog	Gambella	29-Mar	3-Apr	Yes	No	Confirmed
3	35	M	Agnua	Farmer	Duli	Agnua	Gog	Gambella	30-Mar	5-Apr	Yes	No	Confirmed
4	30	M	Agnua	Farmer	Metaget Dipach	Agnua	Gog	Gambella	4-Apr	6-Apr	Yes	No	Confirmed
5	17	F	Agnua	Student	Duli	Agnua	Gog	Gambella	30-Mar	8-Apr	Yes	No	Confirmed
6	40	M	Agnua	Farmer	Wadmaro	Agnua	Gog	Gambella	1-Apr	8-Apr	Yes	No	Confirmed
7	60	F	Agnua	Farmer	Duli	Agnua	Gog	Gambella	22-Apr	23-Apr	Yes	No	Confirmed
8	50	Male	Agnua	Hunter	PRC - Agnua	Agnua	Gog	Gambella	9-Aug	12-Aug	Yes	No	Pending

Table 3 Line List of GWEP Confirmed and Pending Animal Infections 2020*

Case #	Age (years)	Sex	Type of Animal	Animal Infection ID	Village of Detection	Zone	District	Region	Date of Detection	Date of Emergence	Contained (Yes / No)	Entered Water	Lab. Result
1	Young Adult (2)	M	Baboon	A1.1-A1.51	Ablen	Agnua	Gog	Gambella	12-Mar	Unknown	17 worms controlled immersion and 18 worms were subcutaneous	Unknown	confirmed
2	Adult (4)	M	Baboon	A2.1-A2.14	Duli	Agnua	Gog	Gambella	9-May	Unknown	12 hanging worms and 2 more subcutaneous	Unknown	confirmed
3	Young Adult (1.5)	M	Dog	A3.1-3.1	Akweramero	Agnua	Gog	Gambella	25-Jun	25-Jun	Yes	No	confirmed
4	Young Adult (1.5)	M	Dog	A4.1 -A4.7	Berged 3	Agnua	Abobo	Gambella	8-Jul	10-Jul	Yes	No	confirmed
5	Adult (5)	M	Baboon	A5.1 - 5.4	Ablen	Agnua	Gog	Gambella	21-Jul	21-Jul	No	Unknown	confirmed
6	Adult (3)	F	Dog	A6.1 - 6.1	Wichini	Agnua	Gog	Gambella	2-Jul	23-Jul	Yes	No	pending
7	Adult (2)	F	Cat	A7.1 -7.9	Pochalla A: PRC	Agnua	Gog	Gambella	25-Jul	27-Jul	Yes	No	pending
8	Adult (3)	F	Cat	A8.1	Pochalla B: PRC	Agnua	Gog	Gambella	29-Jul	31-Jul	Yes	No	pending
9	Adult (2)	F	Cat	A9.1	Pochalla C: PRC	Agnua	Gog	Gambella	30-Jul	31-Jul	Yes	No	pending
10	Young adult (1.7)	M	Cat	A10.1 – 10.5	Akobo B: PRC	Agnua	Gog	Gambella	28-Jul	31-Jul	Yes	No	pending
11	Adult (2)	M	Cat	A11.1 -	Akobo D: PRC	Agnua	Gog	Gambella	28-Jul	3-Aug	Yes	No	pending
12	Adult (5)	F	Cat	A12.1 - 12.2	Akobo D: PRC	Agnua	Gog	Gambella	7-Aug	9-Aug	Yes	No	pending
13	Young adult (1.8)	M	Cat	A13.1 - 13.2	Akobo D: PRC	Agnua	Gog	Gambella	9-Aug	11-Aug	Yes	No	pending

A CONFIRMED CASE IN SOUTH SUDAN



The South Sudan Guinea Worm Eradication Program (SSGWEP) reported a contained case of Guinea worm disease, since confirmed by the CDC laboratory, in a 20 year old man whose worm emerged and was detected in the town of Tonj (Tonj South County) on July 8th by county health department surveillance officers. The man had traveled to Tonj town in March 2020 from his home village in Makuac payam (Tonj East County) and has a history of travel to cattle camps within Tonj East, Mayendit, and Rumbek North Counties. However, the current evidence suggests it is more likely that he was infected near his home village, as he spent most of his time farming there during the 10-14 month window of infection in 2019. His home village is within Guinea worm endemic clusters at Paweng/Makuac in 2016 and Paliang in 2013 and the patient is also from the same sub-clan as these previous cases in 2016 and 2013.

The SSGWEP National Director Mr. Samuel MAKOY Yibi Logora reports that the program mobilized to respond aggressively to prevent spread from this case and to understand the transmission dynamics in Tonj East. Within 24 hours of detection and reporting the case, the SSGWEP team mobilized from Tonj East and Jur River Counties immediately implemented case containment measures, conducted active case searches, applied Abate to suspected contaminated water sources, distributed cloth and pipe filters, and intensified health education and awareness of the case reward to the general public. SSGWEP Director Mr. Makoy conducted a field visit from July 15-23 to conduct further investigation and refine the response plan at the town of detection, the home village, and all other villages and cattle camps possibly linked to the transmission dynamics of this case. No link to an affected person in 2019 was found.

MALI: ONE DOG INFECTION IN JULY



The National Program Coordinator Dr. Cheick Oumar Coulibaly and Carter Center Country Representative Mr. Sadi Moussa made a supervisory visit to Tominian district in Segou Region and Mopti and Djenne districts in Mopti Region on July 15-23, 2020. All of the health areas of Tominian district report monthly, but three of the 21 health areas are not accessible to outsiders because of insecurity. The team visited all of the endemic villages in Tominian district. A suspected infected dog of unknown origin was reported in Ouan village during their visit to Tominian. The dog's infection was uncontained and has since been confirmed as *D. medinensis*. Mopti district has not reported a Guinea worm infection in the past nine years, but it has been cited as the source of infected dogs detected in Tominian district. Tenenkou district of Mopti Region is also cited as the source of infected dogs detected in Tominian district. Because Tenenkou district is not accessible to the national and regional GWEP teams (it does report monthly to the GWEP) due to insecurity and flooding during the rainy (transmission) season, Dr. Coulibaly and Mr. Moussa met with the district medical officer Dr. Amadou Coulibaly and members of his team in the city of Mopti on July 19th. The supervisory team traveled to Djenne, which is insecure and has reported infected dogs for the past three consecutive years, on July 21-22. In Djenne district they visited three endemic villages (Gomitogo, Soa, Kanafa) and a former endemic village (Senossa), accompanied by Technical Advisors Dr. Saye Moussa and Dr. Elie Timbine. Carter Center GWEP consultant and former National Program Coordinator Dr. Gabriel Guindo and GWEP Data Manager Mr.

Yacouba Traore made supervisory visits to San, Bla, Macina, and Markala districts of Segou Region on July 16-25. Macina district is where Mali's single human case of Guinea worm disease this year (after no human case in 2016-2019) was probably infected during a visit from June to September 2019.

GUINEA WORM IS ENDEMIC IN ANGOLA



In July the reference laboratory at CDC confirmed that the recently-received specimen from a 15 year old boy whose worm emerged in the village of Ofenda in Namacunde municipality of Angola's Cunene Province in **March** 2020 is *Dracunculus medinensis*. This confirmed case of Guinea worm disease follows Angola's first confirmed case in a patient in Oluxua ya Kalunga village of Namacunde municipality in Cunene Province in **April** 2018, another confirmed case in Ndelema village of Cuvelai municipality of Cunene Province in **January** 2019, and a confirmed Guinea worm infection in a dog in Ofenda village of Namacunde municipality of Cunene Province in **April** 2019. With confirmed indigenous Guinea worm infections in three consecutive years, Angola is now officially a Guinea worm endemic country. The Carter Center and WHO are working together to provide training materials through virtual communications. Meanwhile The Carter Center is still seeking the Government of Angola's approval before it can begin providing in-country assistance.

SUSPECT CASE IN VIETNAM IS NOT *D. MEDINENSIS*

A young man was admitted to Vietnam's National Hospital for Tropical Diseases in May 2020 with abscesses on his legs and arms from which doctors removed worms about 1-2 feet long (30-60 centimeters). He had not traveled outside Vietnam, but drank water in a nearby forest. The doctors provided specimens of the worms to WHO, which sent them to the reference laboratory at CDC where laboratory examination found this to be a *Dracunculus* worm, but not *D. medinensis*.

Some other species of *Dracunculus* that infect wildlife occur in Asia, including *D. houdoumeri* which has been described from a snake in Vietnam. Reports of isolated Guinea worm infections in humans in Asia have been published from Java/Indonesia (1926), Korea (1927), Japan (1986) and China (1995) over the years. Some of the patients had a history of eating raw aquatic animals; those worms were assumed to be *D. medinensis* but were not examined in detail in a laboratory and molecular tools were not yet available.

Table 4

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2020* (Countries arranged in descending order of cases in 2019)

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	0 / 1	0 / 3	0 / 1	3 / 3	0 / 0	0 / 0						4 / 9	44%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1						1 / 1	100%
ANGOLA [‡]	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0						0 / 1	0%
ETHIOPIA	0 / 0	0 / 0	0 / 0	7 / 7	0 / 0	0 / 0	0 / 0						7 / 7	100%
MALI [§]	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0						0 / 1	0%
TOTAL*	1 / 1	0 / 1	0 / 5	7 / 8	3 / 3	0 / 0	1 / 1						12 / 19	63%
% CONTAINED	100%	0%	0%	88%	100%		100%						63%	

*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.

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2019* † (Countries arranged in descending order of cases in 2018)

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	0 / 2	1 / 1	1 / 3	2 / 3	11 / 17	4 / 6	4 / 6	2 / 7	1 / 2	0 / 1	0 / 1	0 / 0	26 / 49	53%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	0 / 0	0 / 0	0 / 0	2 / 4	50%
ANGOLA	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0%
ETHIOPIA	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%
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	0%
TOTAL*	0 / 3	1 / 1	1 / 3	2 / 3	11 / 17	4 / 6	4 / 7	3 / 8	2 / 4	0 / 1	0 / 1	0 / 0	28 / 54	52%
% CONTAINED	0%	100%	33%	67%	65%	67%	57%	38%	50%	0%	0%	0%	52%	

*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.

[†]Cameroon reported one case in March that was likely infected in Chad.

RECENT PUBLICATIONS

Boonham N, Tomlinson J, Ostoja-Starzewska S, McDonald RA, 2020. A pond-side test for Guinea worm: development of a loop-mediated isothermal amplification (LAMP) assay for detection of *Dracunculus medinensis*. *J Exp Parasitol* 217:4pp. doi:

<https://doi.org/10.1016/j.exppara.2020.107960>

Cleveland CA, Garrett KB, Cozad RA, Williams BM, Murray MH, Yabsley MJ, 2018. The wild world of Guinea worms: a review of the genus *Dracunculus* in wildlife. *Int J Parasitol Parasites Wildl* 7:289-300. doi: <https://doi.org/10.1016/j.ijppaw.2018.07.002>

Diekmann I, Alnassan AA, Globokar M, Pantchev N, Kurzrock L, Hernandez L, Lopez J, Ruano R, Herrero S, von Samson-Himmelstjerna G, Kruecken J, 2020. Canine *Dracunculus* nematode infection, Toledo, Spain. *Emerg Inf Dis* 26(8): doi: <https://doi.org/10.3201/eid2608.201661>

Wilson-Aggarwal JK, Goodwin CED, Swan GJF, Fielding H, Tadesse, Z, Getahun D, Odiel A, Adam A, Marshall HH, Bryant J, Zingesser JA, McDonald RA, 2020. Ecology of domestic dogs (*Canis familiaris*) infection in Ethiopia. *Transboundary and Emerging Diseases* 00:1-12. doi: <https://doi.org/10.1111/tbed.13711>

World Health Organization, 2020. Monthly report on dracunculiasis cases, January-June 2020. *Wkly Epidemiol Rec* 95:379-380. <https://www.who.int/wer/2020/wer9532/en/>

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 Adam Weiss (adam.weiss@cartercenter.org), 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, Dr. Donald Hopkins and Adam Weiss of The Carter Center, Dr. Sharon Roy of CDC, and Dr. Dieudonne Sankara of WHO.

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<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



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