



Date: May 20, 2020
From: WHO Collaborating Center for Dracunculiasis Eradication, CDC
Subject: GUINEA WORM WRAP-UP #268
To: Addressees

Detect and Contain All Guinea Worm Infections Promptly!

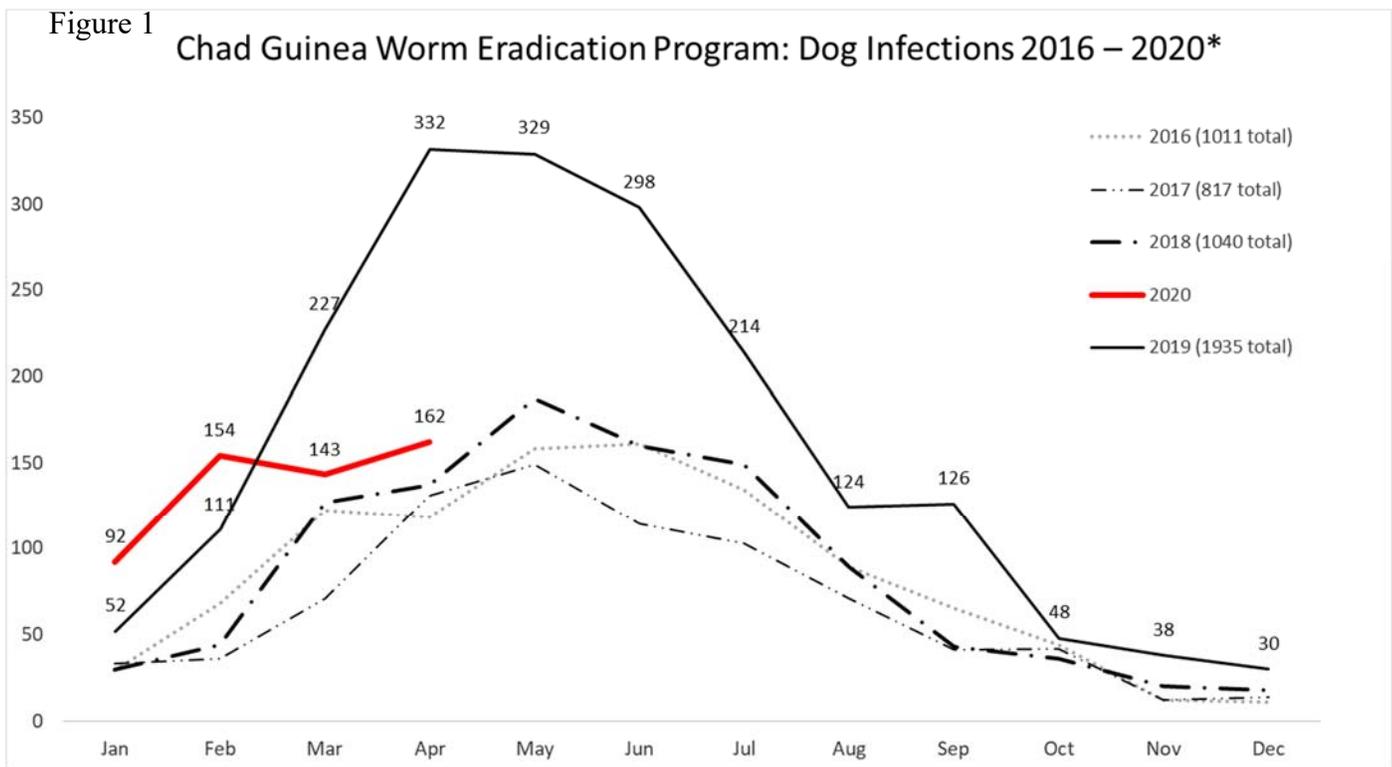
CHAD: TURNING THE TIDE?



Chad’s Guinea Worm Eradication Program (CGWEP) has reported a provisional total of 551 dogs with Guinea worm infections in January-April 2020 compared to 722 infected dogs reported in the same period of 2019, for a provisional year-to-date reduction of 24%. The monthly changes in reported dog infections for January-April this year are +73%, +39%, -37%, -51% (**Figure 1**). Chad has reported 12 infected cats in January-April 2020, compared to 3 infected cats in January-April 2019.

Chad reported 4 confirmed human cases (2 contained) in January-April 2020, compared to 9 human cases (4 contained) in the same period of 2019. In 2019, 19 of the 48 human cases detected

Figure 1
Chad Guinea Worm Eradication Program: Dog Infections 2016 – 2020*



in Chad lived in the village of Bogam in Salamat Region, and 3 other cases (#10, #14 and #17 in the line list in *Guinea Worm Wrap-Up* #266) are believed to have been infected in the water-borne outbreak in Bogam.

This apparent favorable trend in reduction of dog infections in Chad so far in 2020 follows the Chad program's significant expansions between 2018 and 2019 of active surveillance (17% increase in villages under active surveillance, from 1,895 to 2,211 and 186% increase in rumors of Guinea worm infections in humans and animals, from 36,207 to 103,442) and Abate coverage of 1+ Guinea worm villages (from 24% to 78%). Already in 2020, the CGWEP has launched a new initiative to proactively tether dogs during the period of peak Guinea worm transmission (see *Guinea Worm Wrap-Up* #267), reaching about 80% of the target 118 villages with 5+ infections and almost 70% of all eligible dogs in those villages by the end of April, and it has increased the case containment rate for Guinea worm infected dogs from 76% in 2019 to 83% in January-April 2020. Bravo!, and bear down, Chad!!

ETHIOPIA FINDS 7 SUSPECTED HUMAN CASES



After two consecutive years without any reported human cases of Guinea worm disease, Ethiopia's Dracunculiasis Eradication Program (EDEP) reported a total of 7 Guinea worm suspect cases in Duli, Metaget Dipach and Wadmaro villages of Gog district in Gambella Region from April 2-23, 2020. Five of them were from Duli (Angota side) (Lat: 7.619767 N, Lon: 34.431960 E); one each from Metaget Dipach (Lat: 7.614328 N, Lon: 34.448344 E); and Wadmaro (Lat: 7.606878 N; Lon: 34.447607 E). Even though two of the seven suspects were detected outside Duli Village, it is believed that both of them contracted the infection from exposure in Duli Village where they were farming in 2019.

Duli has 47 households, 156 inhabitants, and 81 dogs. The first case, a 14-year-old Agnuak girl, noticed swelling and itching on her right leg on March 29, 2020 and reported it immediately to her mother, who is a village-based Guinea worm volunteer for EDEP. After bandaging, health education, and close observation the worm emerged on April 2, 2020. A team from the EDEP began investigations the same day. In the days that followed, Guinea worms emerged from a 12 year old Agnuak girl on April 4, from a 35 year old male Agnuak farmer (father of case #2) on April 5, from a 30 year old male Agnuak village-based volunteer on April 6, from a 17 year old female Agnuak student and a 40 year old male Agnuak farmer on April 8, and from a 60 year old female Agnuak farmer on April 23.

Six out of the seven suspect cases who were residents in Duli, Wadmaro, and/or Metaget Dipach villages had Guinea worms emerge on April 2-8, 2020 and on April 23 for the seventh case, who was a resident in Duli. The worm of case#1 emerged when she was under care of a village based volunteer at her village; then she was moved to a case containment center; all other 6 patients' worms emerged in a CCC (Figure 2). This sharp cluster of the first six cases with onset within seven days of each other indicates they were exposed to a common point source of infection. All 7 patients were isolated in a case containment center and contained. The laboratory at CDC has not yet confirmed the diagnosis of *D. medinensis* on worms in this outbreak, pending receipt of the specimens.

Table 1

Ethiopian Dracunculiasis Eradication Program

GWEP Line Listing of Provisional Cases 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	Pending
2	12	F	Agnua	Student	Duli	Agnua	Gog	Gambella	29-Mar	3-Apr	Yes	No	Pending
3	35	M	Agnua	Farmer	Duli	Agnua	Gog	Gambella	30-Mar	5-Apr	Yes	No	Pending
4	30	M	Agnua	Farmer	Metaget Dipac	Agnua	Gog	Gambella	4-Apr	6-Apr	Yes	No	Pending
5	17	F	Agnua	Student	Duli	Agnua	Gog	Gambella	30-Mar	8-Apr	Yes	No	Pending
6	40	M	Agnua	Farmer	Wadmaro	Agnua	Gog	Gambella	1-Apr	8-Apr	Yes	No	Pending
7	60	F	Agnua	Farmer	Duli	Agnua	Gog	Gambella	22-Apr	23-Apr	Yes	No	Pending

* provisional

GWEP Line Listing of Animal Infections 2020*

Case #	Age	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+ years old)	M	Baboon	A1.1-A1.51	Ablen	Agnua	Gog	Gambella	12-Mar	Unknown	17 worms controlled immersion and 18 worms were subcutaneous	On active abate cycle	
2	Adult (4+ years old)	M	Baboon	A2.1-A2.14	Duli Village (Angota Side)	Agnua	Gog	Gambella	9-May	Unknown	12 hanging worms and 2 more subcutaneous	On active abate cycle	

No human case of Guinea worm disease has been reported in Gog Dipach sub-district of Gog district for more than seven years and from anywhere in Gog district for four years. A baboon with a Guinea worm infection was killed in Duli village in June 2017 and another in June 2019. The EDEP also reported a baboon with a provisional Guinea worm infection in March 2020 in Ablen Village, Atheti sub-district of Gog District. On May 9, 2020 a villager killed a baboon with 31 emerging provisional Guinea worms that was part of a nearby troop of baboons stealing maize stored in a house at Duli Farm. Table 1 is a line list of the cases and the infected baboon in 2020.

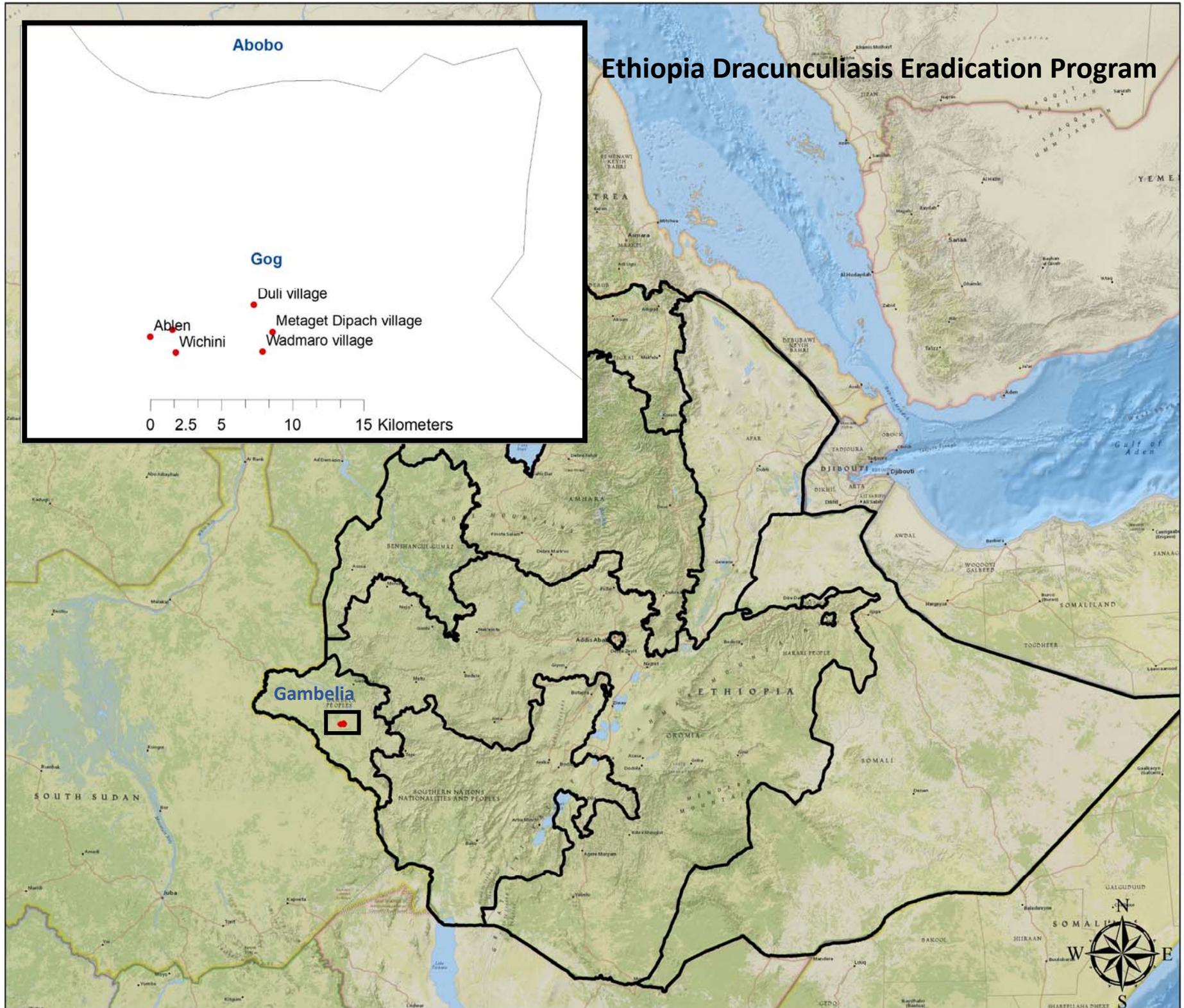
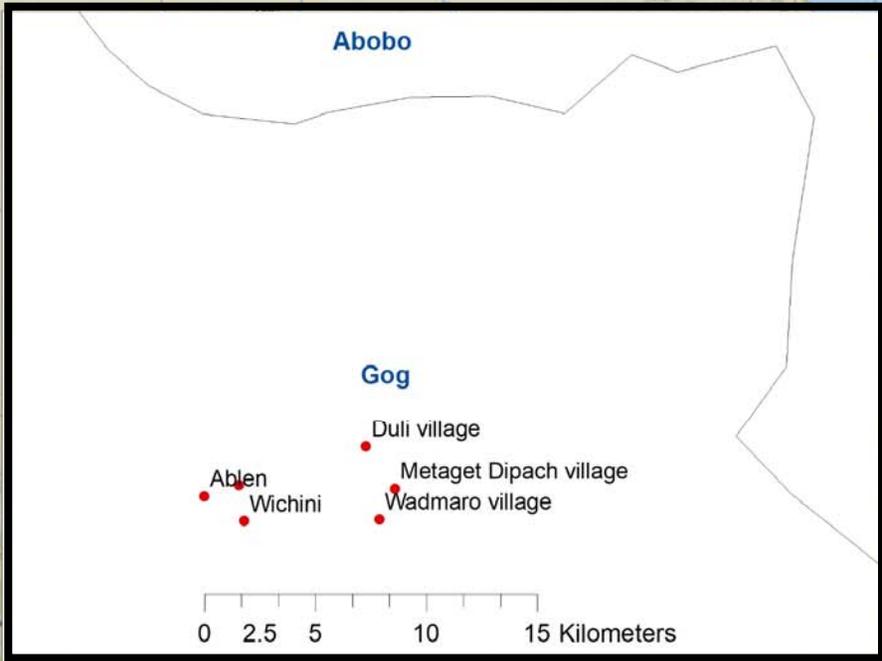
All dogs in these villages were proactively tethered since early 2019. In 2019, Atheti Village reported two dog infections that were contained. No dogs or cats in the area were found to have Guinea worm infections so far in 2020. Duli reported two infected dogs in 2016.

After preliminary investigation the EDEP applied Abate to 41 ponds associated with these case investigations (beginning within two days of the first suspect case report), actively searched for suspect cases in seven at-risk villages, distributed cloth filters, conducted health education of villagers, followed up approximately 150 persons directly connected to the suspected cases, and admitted 173 potentially exposed persons in the case containment center and at a temporarily established case containment center in a health facility for observation (in addition to the 7 cases). One hundred and eight (108) of the 173 potentially exposed persons have been discharged from the case containment centers. The team noted that more than 90% of households in Duli have cloth and pipe filters, but utilization is poor, partly because of boreholes in the area. The EDEP conducted active case searches in seven villages in Gog Dipach and adjacent sub-districts of Gog district and interviewed 1,447 people. It also conducted active case searches in seven villages and three commercial farms of adjacent Abobo district in which 2307 people were interviewed. During the case search, 575 people in Gog Dipach sub-district gave travel history to Duli village Angota side (= farms located next to Duli village) during the previous 10-14 months and were enlisted for daily follow-up. As an extension of the outbreak investigations and response, 5,599 people who are living in other districts of Gambella region were interviewed during active case searches.

Duli has one functioning borehole well located one hour walk from the village. Wadmaro has five boreholes, only two of which are functioning. Metaget Dipach uses the borehole from Wadmaro village. Two ponds where the cases' households collected drinking water when the rains began in mid-March 2019, Lel Aber and Lel Bonge, are close to areas where baboons rest and spend the night and are also used by the baboons. These water sources were supposed to all be on the regular Abate cycle in 2019. According to the village-based Guinea worm volunteer who began working in the area in June 2019 his predecessor did not perform the duties assigned to her from January to April 2019.

The EDEP is commended for detecting all of the human cases in this outbreak before their worms emerged and containing all of them. The circumstances suggest that proper application of Abate to ponds shared by humans and baboons in this area in 2019 could have prevented the outbreak. This incident also shows the risk of big Guinea worm outbreaks in humans who live in areas where humans or animals are still infected but who do not have convenient access to safe drinking water. Outbreaks at Goyi Farm/Ethiopia in 2017 and Bogam village/Chad in 2019 demonstrate the same risk.

Ethiopia Dracunculiasis Eradication Program



LATE BREAKER: On May 13, 2020 welcome news arrived that the borehole well under construction at Goyi Farm, which was the site of the surprise outbreak of 15 cases of Guinea worm disease among migrant laborers in Gambella Region's Abobo district in September-December 2017, yielded ground water. The remaining work is expected to be completed in one week and the borehole well will then be functional immediately. This successful and long-awaited outcome is the result of persistent advocacy by Guinea Worm Goodwill Ambassador Honorable Dr. Tebebe Yemane Berhan, the EDEP, and many other Ethiopian officials. Bravo!, and Congratulations to all!

In the first quarter of 2020, the EDEP:

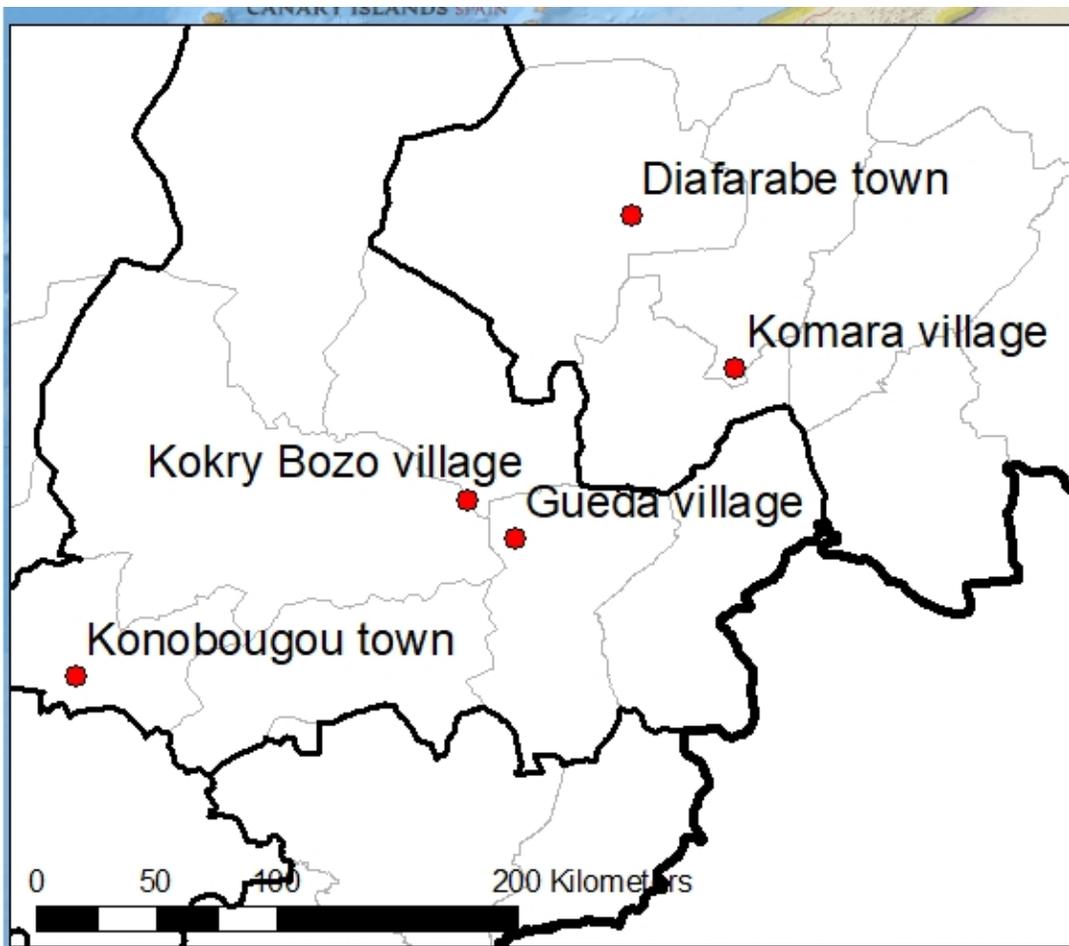
- Revitalized the National Certification Committee for Guinea worm elimination.
- Received reports of 5,532 rumors of Guinea worm cases throughout the country and investigated 99.8% of them within 24 hours.
- Visited 28,626 households (131,230 persons) in nine refugee camps during the monthly house to house case searches and delivery of health education messages. Through these searches 380 rumors of Guinea worm disease were reported and 376 (99%) were investigated within 24 hours.
- Assessed reward awareness level in four refugee camps in Benishangul Gumuz Region. Of 640 persons queried, 81% knew of the reward for reporting a case and 79% knew the correct amount of the cash reward.
- Conducted two-days training for 52 health professionals from four refugee camps in Benishangul Gumuz Region.
- Distributed 500 Guinea worm disease identification cards, 100 cash reward posters, and 40 case definition posters in four refugee camps of Benishangul Gumuz Region.

MALI FINDS A HUMAN CASE AFTER FOUR YEARS

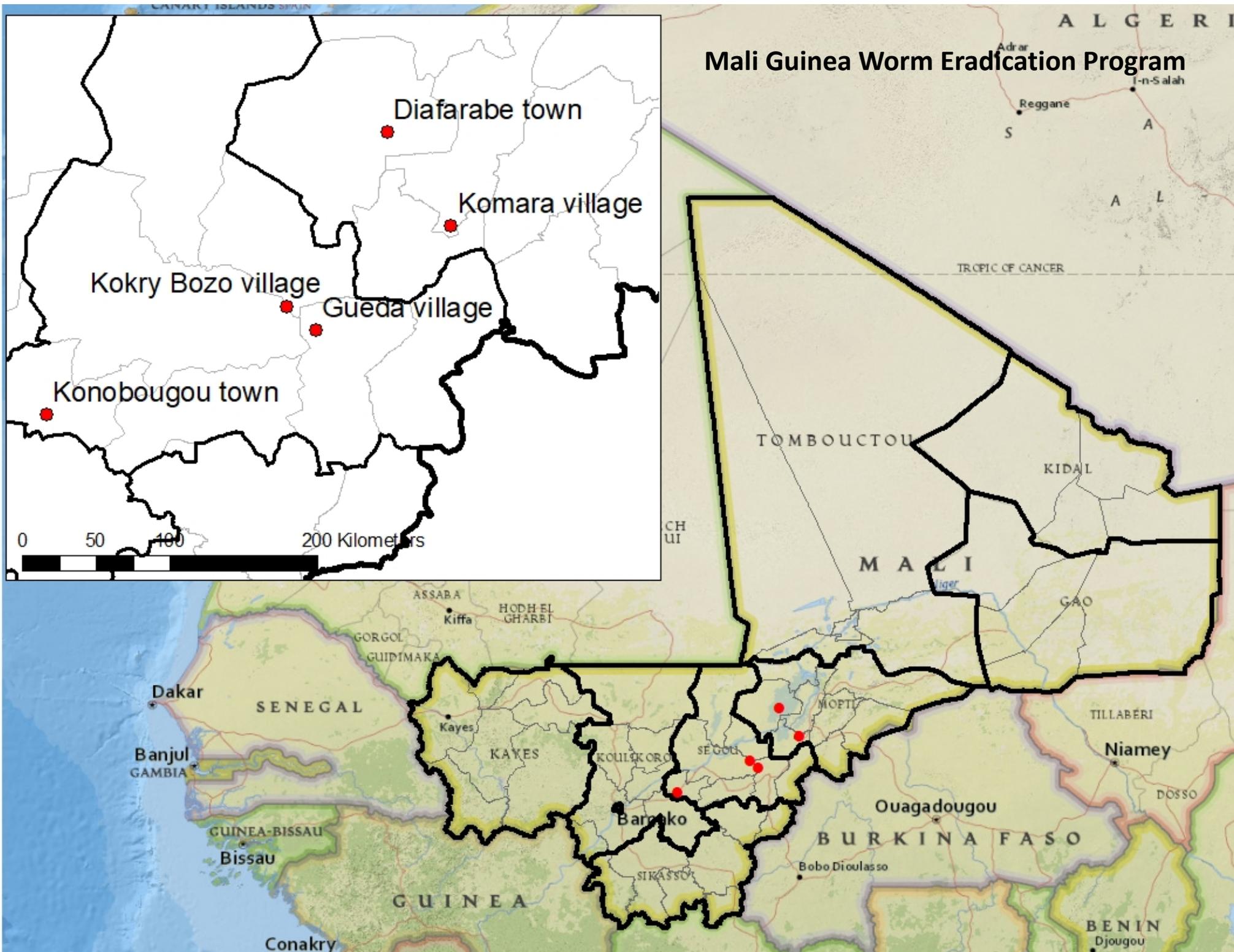


After detecting no Guinea worm infections in humans in 2016-2019, Mali's Guinea Worm Eradication Program (MGWEP) has reported a confirmed case of Guinea worm disease in a human in 2020. During the four years without any human cases the MGWEP reported 11 infected dogs in 2016; 9 dogs and 1 cat in 2017; 18 dogs, 2 cats in 2018; and 8 dogs, 1 cat in 2019. All of the infected domestic animals occurred in a few adjacent districts of Mopti and Segou Regions that are part of the inland delta of the Niger River, including some areas that have not been completely accessible to the MGWEP since 2012 due to insecurity.

The infected person is a 15 year old Bozo girl from the small town of Konobougou in Baraoueli district of Segou Region whose first worm emerged on March 23, 2020. A second worm emerged on April 27. Her infection was not contained because the worm emerged before she was isolated, but transmission is unlikely because she was hospitalized at the local health center and Konobougou has a safe system of drinking water. Baraoueli district has not had a known Guinea worm infection since 2011. However this patient visited the village of Komara in Macina district/Segou Region from July to September 2019. Macina district reported 2 dogs infected with Guinea worms in 2018 in the village of Gueda, and 2 animal infections in 2019: one in a dog in Gueda and the other in a cat in Kokry Bozo. Komara is about 25 kilometers (~15 miles) from the small town of Diafarabe in Tenenkou district/Segou Region. Diafarabe was the alleged source of an infected dog (#3 on the line list in *Guinea Worm Wrap-Up #263*) that was detected in Tominian district/Segou Region on July 27, 2019. Komara is a village of fishermen and farmers that has one borehole well and four protected wells, and is flooded from July to October. Diafarabe has a safe system of running water (Figure 3).



Mali Guinea Worm Eradication Program



Following discovery of the suspect case the MGWEP put all villages in Baraoueli district under active surveillance. Health staff from the district and the Konobougou health center visited the patient on March 23rd and collected a specimen of the worm. National Coordinator Dr. Cheick Oumar Coulibaly, consultant Dr. Gabriel Guindo (a former national coordinator) and the Guinea worm focal point person for Segou Region conducted an investigation in Konobougou on March 26, but were not able to visit the village of Komara because of insecurity. After the case was confirmed by the laboratory at CDC, the national coordinator and the data manager made a cross investigation visit to Konobougou and Macina accompanied by staff from Segou Region on April 16-19; they were not able to visit Komara because of insecurity but discussed the case with the district medical officer, local Guinea worm *Medecin d'Appui*, and the health officer in charge of the health center Soumani which covers Komara village. The Guinea worm *Medecin d'Appui* based in Macina was able to make an investigation in Komara on April 23rd after traveling by motorcycle (access with a vehicle was a risk). The Guinea worm *Medecin d'Appui* based in Markala/Segou led a visit to Konobougou on April 27 after the girl's second worm emerged.

While this new case in a human in Mali after four consecutive years with no case is disappointing it is notable that Mali's surveillance system detected and investigated this case of Guinea worm disease promptly, even though it occurred in a relatively remote and partly insecure area. Like the recent disappointing human cases in Ethiopia after two years without human cases, this new case in Mali also shows the on-going risk of Guinea worm cases in humans so long as D. medinensis transmission continues in animals in the area. The fact that apparently only one person was infected suggests that she was infected by eating a paratenic or transport host such as a fish or frog, not by drinking water from a contaminated source that would have been shared by other persons. The "peculiar" potential mode of transmission via paratenic and/or transport host is the presumed mode of transmission for almost all recent human Guinea worm infections in Chad, where the endemic area is also riverine like this part of Mali.

SUSPECT CASE IN ANGOLA

On April 14, 2020 Angolan health authorities informed the World Health Organization that they had discovered on March 29, 2020 a suspect case of Guinea worm disease and preserved the worm specimen from a 15 year old boy in the village of Ofenda in Namacunde municipality of Cunene Province. No other details are available at this time. The area of concern is currently said to be flooded. This suspect case follows Angola's first confirmed case of Guinea worm disease ever, from a patient in Oluxua ya Kalunga village of Namacunde municipality in Cunene Province in April 2018 (*Guinea Worm Wrap-Up* #256); a second confirmed human case in Ndelema village of Cuvelai municipality in Cunene Province in January 2019 (*Guinea Worm Wrap-Up* #259); and a confirmed Guinea worm infection in a dog in the village of Ofenda in Namacunde municipality of Cunene Province in April 2019 (*Guinea Worm Wrap-Up* #261).

The Carter Center is still seeking the Government of Angola's approval before it can begin providing in-country assistance. WHO recently made available \$240,000 to Angola's GWEP to help support active surveillance in the affected area of the country. The Carter Center and WHO are working together to provide training materials through virtual communications in the meantime.

WHO HELPS SUDAN PREPARE FOR CERTIFICATION



**World Health
Organization**

Sudan is the only country in WHO's Eastern Mediterranean Region yet to be certified free from Guinea worm transmission. With the goal of helping Sudan prepare to meet the criteria for certification as free of Guinea worm transmission, a recent WHO mission to Sudan in November 2019 recommended that Sudan focus on strengthening surveillance, raising nationwide awareness of Guinea worm disease and of the cash reward for reporting a case, as well as on conducting active case searches in previously endemic communities and in at-risk border areas.

To ascertain that at-risk areas are free of Guinea worm and to impart health education, active case searches were carried out from March 18 to April 4, 2020 in South Darfur State, which borders South Sudan and includes the Kafia Kingi area where Guinea worm cases were confirmed in 2013 and suspect cases reported in 2017. The team sought to help foster robust evidence on absence of Guinea worm transmission in humans, dogs and other animals in formerly endemic and border areas; assess awareness levels about Guinea worm disease; as well as sensitize, orient and train volunteers from at-risk areas about the disease and equip them with updated health education and reporting materials for establishing community surveillance.

The teams covered five localities in South Darfur State, namely El Radom, Kafia Kingi area, Sunta, Burram, and Bilail with approximately 18,000 South Sudan refugees, as well as newly-identified villages and at-risk areas in each locality of potential Guinea worm transmission, in consultation with local and state ministry officials. The survey was completed using the standard WHO individual questionnaire, customized to the context of Sudan. It included questions regarding humans and animals about the cash reward, Guinea worm prevention, access to safe water, and awareness of Guinea worm transmission to humans and animals. Nine thousand (9,000) households were covered mainly from refugee areas as well as adjacent and bordering villages and local populations at risk of Guinea worm importation due to proximity and movement of refugees and animals from South Sudan. After the survey each locality was provided health education and awareness materials on Guinea worm disease. The teams established active surveillance with about 120 newly identified volunteers in these at-risk areas.

The teams found no active case of Guinea worm disease. Data from these active case searches are being analyzed and a report will be issued soon. Similar surveys will be conducted in three remaining states of Sudan once the COVID-19 crisis is minimized.

Table 2

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	1 / 2	0 / 0									2 / 4	50%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0									0 / 0	
ANGOLA [^]	0 / 0	0 / 0	0 / 0	0 / 0									0 / 0	
ETHIOPIA	0 / 0	0 / 0	0 / 0	7 / 7									7 / 7	
MALI [§]	0 / 0	0 / 0	0 / 1	0 / 0									0 / 1	
TOTAL*	1 / 1	0 / 1	1 / 3	7 / 7									9 / 12	75%
% CONTAINED	100%	0%	33%	100%									75%	

*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%		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.

COVID-19 AND GUINEA WORM ERADICATION

In response to the COVID-19 pandemic the World Health Organization has issued guidance to ministries of health for implementation of Neglected Tropical Disease programs that stresses the importance of hand hygiene, physical distancing, and respiratory etiquette, among other measures to reduce the spread of COVID-19. National ministries of health decide how to adapt public health services and programs during the current crisis. The goal is to prevent spreading COVID-19 to the public or program staff while implementing essential medical and public health activities. Guinea Worm Eradication Program staff are urged to abide by these decisions and guidelines for their own safety and the safety of the persons they serve. The potential penalties for negligence in protective measures or mistakes in implementing programs are significant. Some national GWEPs are assisting COVID-19 awareness and education activities. Curtailed air travel and cargo have caused early departure of some international technical advisors, delayed shipments of some worm specimens, and led to postponement or cancellation of some in-country research activities. We shall overcome this crisis, as generations before us have conquered past challenges.

...one learns at the cost of human life what happens when one receives from God the scourge of an epidemic without having any light or experience wherewith to guide one's conduct in so exacting a task.
[From a notebook written during an outbreak of plague in northern Italy in 1631: Cipolla CM, 1973. *Cristofano and the plague*. London: Collins, p73]

MEETINGS

The 14th Meeting of the International Commission for the Certification of Dracunculiasis Eradication that was scheduled to be held at WHO headquarters in Geneva, Switzerland on April 15-16, 2020 has been postponed. New dates are being considered.

The World Health Assembly this year will be convened virtually. There will not be an Informal Meeting to discuss the Guinea Worm Eradication Program.

RECENT PUBLICATIONS

McDonald RA, Wilson-Aggarwal JK, Swan GJF, Goodwin CED, Moundai T, Sankara D, Biswas G, Zingesser JA, 2020. Ecology of domestic dogs *Canis familiaris* as an emerging reservoir of Guinea worm *Dracunculus medinensis* infection. PLOS Negl Trop Dis <https://doi.org/10.1371/journal.pntd.0008170>

World Health Organization, 2020. Monthly report dracunculiasis cases, March 2020. Wkly Epidemiol Rec 95:171-172.

World Health Organization, 2020. Annual global surveillance summary for dracunculiasis eradication 2019. Wkly Epidemiol Rec 95:209-228
<https://apps.who.int/iris/bitstream/handle/10665/332085/WER9520-eng-fre.pdf>

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.

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