

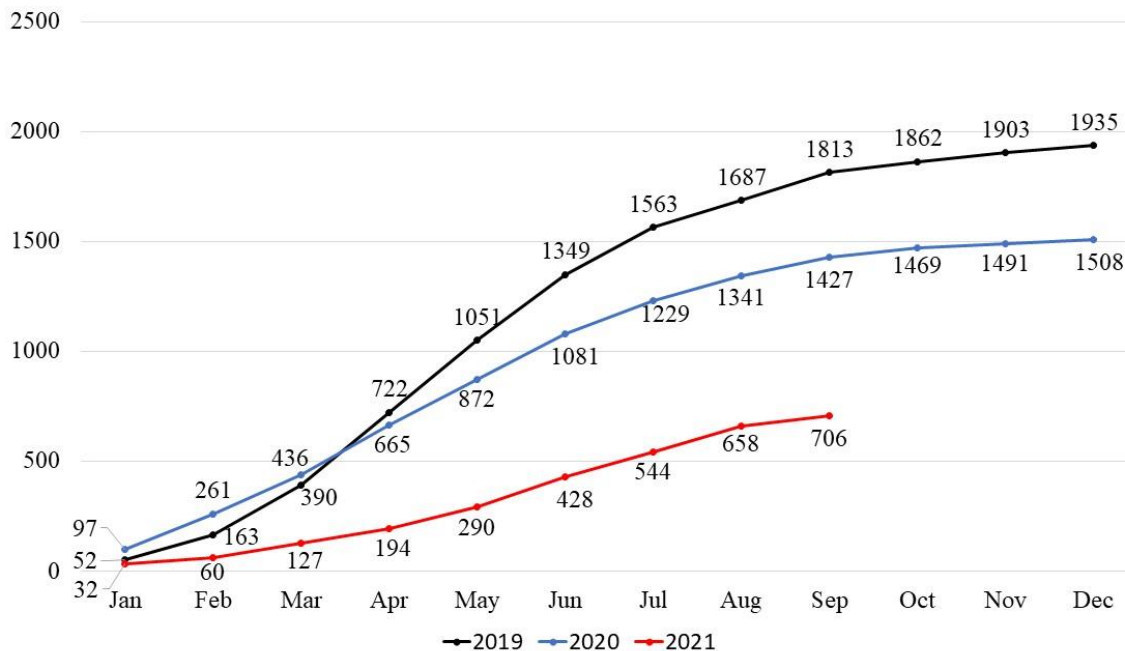


Date: October 18, 2021
From: WHO Collaborating Center for Dracunculiasis Eradication, CDC
Subject: GUINEA WORM WRAP-UP #282
To: Addressees

Detect and contain every Guinea worm! Investigate the source of each case!

Figure 1

Cumulative Dog Infections in Chad 2019-2021*



**January – September*

CHAD CONTINUES TO REDUCE DOG INFECTIONS AND HUMAN CASES



As of the end of September, Chad had provisionally reported 706 infected dogs (81% contained) so far in 2021, which is a 51% reduction compared to the 1,427 infected dogs reported during the same period of 2020 (Figure 1). Chad also reported 56 infected cats (80% contained) in January-September 2021, compared to 63 infected cats in January-September 2020. The six laboratory-confirmed Guinea worm cases in humans that Chad has provisionally reported in January-September 2021, four (67%) of which were contained, are 45% fewer than the 11 human cases that Chad reported in the same period of 2020.

In September The Carter Center facilitated a webinar in French and English for Senior Technical Advisors in Chad on conducting case investigations. This was part of a larger roll out of technical training and capacity development to support Chad's GWEP. Ms. Karmen Unterwegner made a supportive visit to Chad on October 1-20.

The Minister of Health has made changes in the leadership of Chad's Guinea Worm Eradication Program: Dr. Youssouf Haggat replaced Mr. Tchoufienet Moundai as the new Deputy Coordinator of the program. Dr. Tchindebet Ouakou remains the National Program Coordinator. Mr. Tchoufienet Moundai (known as Calvin) was Deputy Coordinator of the GWEP from 2012 to 2021, during which time he served the program with determination. An entomologist by training, Tchoufienet contributed significantly to research efforts to understand the new Guinea worm transmission involving dogs and carried out quality control of treatment of water bodies with temephos (Abate), which has allowed the program to improve that intervention. His skills, especially his critical thinking about program interventions, and infectious smile will be greatly missed. He has promised to stay in touch with the program. We wish him every success in his next journey.

IN BRIEF:

Cameroon has reported ten laboratory-confirmed dogs with Guinea worm infections in three villages (Bastebe, Dabana, Nouldaina) close to the border with Chad in the same cluster of villages that had 8 infected people and animals in 2019-2020 (1 human in 2020; 1 human, 5 dogs and 1 cat in 2021). The infections occurred between February 3 and March 27, 2021. People in these villages have family on both sides of the border and move back and forth. All ten dogs' infections were contained, and all appropriate water sources were treated with Abate within fourteen days.

Central African Republic (C.A.R.) reported a Guinea worm in a dog that was detected in the village of Mignamani in Ndele sub-prefecture of Bamingui-Bangoran Prefecture on December 12, 2020. A village volunteer from Boussa detected a dog with a hanging worm while she was visiting her family in a village of C.A.R. called Mignamani located at 30 km from the Barh Aouk, the river separating Chad from C.A.R. in Kyabe/Haraze. This volunteer pulled the worm out and brought it back to Chad. There were numerous delays following the return of the volunteer to Chad and passing the specimen to program staff for delivery to N'Djamena. The owner of this dog reportedly lives in Chad. Because of the extreme insecurity in the area, which shares a border with Chad's endemic regions of Moyen-Chari and Salamat, the specimen only reached CDC in May 2021. The CDC laboratory confirmed the worm as *D. medinensis*. WHO is attempting to help the C.A.R. conduct a full case investigation and search of the immediate locality and surrounding area.

South Sudan has reported a provisional case of Guinea worm disease in a 9-year-old boy in Awerial County of Lakes State. The boy's worm emerged on October 6 and was detected the same day in Tomrok village. An investigation and interventions are underway. The most recent known Guinea worm case in Lakes State was in 2018. In January-August 2021, the South Sudan Guinea Worm Eradication Program responded to 30,288 rumors of human Guinea worm cases and 399 rumored animal infections. As the country nears the end of its traditional transmission season, only two cases have been confirmed so far this year. The program has increased on the ground support in those latter two locations significantly, adding 37 more staff to help prevent new cases and ensure other cases are not missed.

South Sudan plans to hold its annual in-country Guinea Worm Program Review on December 9-10, 2021.

MALI: DOGS ARE MAINTAINING GW INFECTIONS



Mali has reported only two confirmed cases of Guinea worm disease in humans, as well as 12 confirmed and 3 provisional infections in dogs in January-October 2021. One of the three provisional dog infections is from Kanafa neighborhood in Djenne town/Mopti Region; the worm emerged on September 21 but was not contained because the infection was not detected until September 22. The source of infection is presumably indigenous since Djenne town had three known dog infections in August-September 2020. Mali also reported a provisional dog infection with worm emergence on October 1, 2021, in Bathiridougou village of Tominian district/Segou Region. The latter infection was contained but the presumed source of that dog infection is unknown. A 3rd provisional dog infection (uncontained) was reported with worm emergence on October 7, 2021, in a new quartier of Djenne town named ATT Bougou, and the presumed source of that infection is Djenne town. The dog was tethered after the worm was detected. Abate was applied in response to all these Guinea worm cases and infections except the first human case (worm emerged August 3) and two dog infections (August 5, 20). A line list of the first confirmed human case, the second human case, and the first twelve dog infections was included in the previous issue. An updated line list will be included in the next issue.

So far this year, there are four locations in Mali with known Guinea worm cases in humans and/or known infections in animals in two consecutive years, 2020 and 2021: *Djenne town* in Djenne Central health zone of Djenne district/Mopti Region; *Macina town* in Macina Central health zone of Macina district/Segou Region; *Kolongo Bozo hamlet* and *Kolongo Bozo village* in Kolongo health zone of Macina district/Segou Region. Djenne Central and Macina Central health zones also had known dog infections in June-August 2019 and in July-October 2018. Mali detected no Guinea worms in humans in 2016-2019. All Guinea worm infections in Mali in recent years have occurred in the 300-mile (500 km)-long inland delta of the Niger River (see map in *Guinea Worm Wrap-Up* #280), an endemic zone ecologically similar to the endemic area along the Chari River in Chad.

Mali's GWEP is beginning to incorporate proactive tethering in 2021 for the first time in cooperating villages that had one or more infected dog(s) or cat(s) in 2019-2020. Dogs are tethered and cats are caged by their owners, with support provided by Mali's GWEP. Compliance is monitored by the *relais*, village health worker, and the village chief. Dog traders are identified and briefed in each health district, and a framework for collaboration is established between health and animal health workers. Insecurity remains the main challenge for the program; access is limited in parts of Djenne, Tenenkou, Yowarou, and Mopti districts in Mopti Region and in Macina, Markala, and Tominian districts in Segou Region. National Program Coordinator Dr. Cheick O. Coulibaly, Carter Center Country Representative Mr. Sadi Moussa, Carter Center GWEP Director Mr. Adam Weiss (virtually), and Carter Center Associate Program Director Ms. Karmen Unterwegner participated in a training and capacity development session for GWEP Technical Advisors that was held in Bamako on September 27-30, 2021. Ms. Unterwegner participated in the latter part of the session during her 3-day supportive visit to Mali's GWEP.

ETHIOPIA: SPOTLIGHT ON INFECTED CATS



The Pugnido Refugee Camp (PRC) in Ethiopia’s western Gambella Region detected 1 domestic dog in 2017; 5 domestic cats and 1 domestic dog with Guinea worm infections in 2018; no Guinea worm infections in 2019; 8 infected cats and 2 human cases in 2020; and 1 provisional cat infection so far in 2021 (Table 1). These are the only Guinea worm infections ever detected in domestic cats in Ethiopia. The 13 confirmed infected cats included 7 males and 6 females, averaged 2.4 years old (range: 19 months-5 years), and their worms emerged in June-September during the peak rainy months in Gambella (May-September). The program recently reviewed and investigated the 2018-2021 infections further and reported the following observations.

Table 1

GUINEA WORM INFECTIONS IN PUGNIDO REFUGEE CAMP (PRC), ETHIOPIA 2018-2021*			
Host	Location of detected infection	Date of worm emergence	Contained?
2018			
Dog	PRC Agnuak Pochalla A	May 14	Yes
Cat	PRC Agnuak Akobo E	June 19	No
Cat	PRC Agnuak Pochalla D	June 22	No
Cat	PRC Agnuak Pochalla D	July 31	Yes
Cat	PRC Agnuak Pochalla B	August 2	No
Cat	PRC Agnuak Pochalla D	August 9	No
2019			
No infections in PRC			
2020			
Cat	PRC Agnuak Pochalla A	July 27	Yes
Cat	PRC Agnuak Pochalla B	July 31	Yes
Cat	PRC Agnuak Pochalla C	July 31	Yes
Cat	PRC Agnuak Akobo B	July 31	Yes
Cat	PRC Agnuak Akobo D	August 3	Yes
Cat	PRC Agnuak Akobo D	August 9	Yes
Cat	PRC Agnuak Akobo D	August 11	Yes
Human/M50	PRC Agnuak Pochalla D	August 12	Yes
Cat	PRC Agnuak Pochalla D	August 20	Yes
Human/M40	PRC Agnuak Pochalla D	September 8	Yes
2021			
Cat	PRC Agnuak Akobo C	August 20	No

**Provisional; in column 1, M50=Male,50y; M40=Male,40y*

Figure 2 shows the household locations of the provisional (2021) infected cat and the 8 confirmed infected cats of 2020. The blocks and households of the camp are close to each other, with no physical boundaries separating them. The camp is divided into primary sections, one called PRC Nuer and the other PRC Agnuak. Historically, infections of GW have only occurred in the PRC Agnuak area. The camp is divided into two areas: the Pochalla sections for persons from Pochalla in South Sudan, and

Akobo sections for persons from Akobo in South Sudan. Most PRC Agnuak inhabitants are from the Agnuak ethnic group and have resided in the camp for many years.

Figure 2

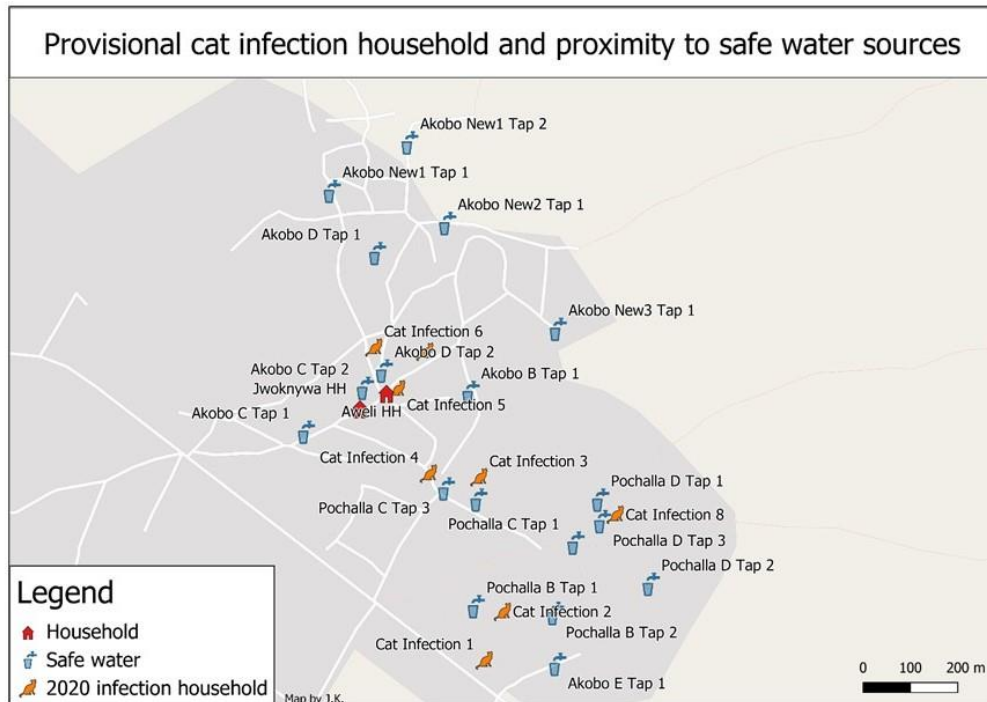


Figure 2. Map of 2021 and 2020 cat infections with proximity to safe water taps. The two households shown (in red) are of the households where the provisional 2021 infection was known to live in 2020 and in 2021.

There are more dogs in the camp than cats: a census of PRC Agnuak in August 2021 counted 548 tethered dogs and 194 tethered cats. The PRC is surrounded by large investment farms and forested area with baboons; it has many overflowing water sources from communal water taps inside the camp and many puddled pond waters in the forest and farmland. The 8 infected cats in 2020 appear to have been infected from a common source since their first worms all emerged between July 27 and August 20. Since all the infected cats in 2020 were detected when they were tethered already, the program considered them contained. However, some cat owners reportedly release their cats at night to protect the household from rodents and so the cat can protect itself against untethered cats. The 2020 infected cats were all released by their owners and roamed in the camp or nearby forest areas 10-14 months before their worm(s) emerged, and all had access to frogs and lizards inside the household while they were tethered. All reportedly were provided only borehole water while tethered. Owners are more likely to provide fish to cats than to dogs since the cats (unlike dogs) reportedly do not like the maize flour and lentils provided by the program as supplemental pet food. The program is unsure how the cats in 2020 contracted their Guinea worm infections but believes transmission may have occurred by drinking from a contaminated water source within the camp while the cats were roaming, or possibly from undetected transmission in the surrounding forest areas, or possibly from eating infected frogs.

Since the outbreak in 2020 the Ethiopian Dracunculiasis Eradication Program (EDEP) has hired local officials to patrol the camp at night when cats are more active to identify animals that have been released

from tethering, but untethered cats are very difficult to identify as they are smaller and faster than dogs and harder to see at night. Multiple safe water taps are available in the camp (see Figure 2). Some households report using latrines or shallow pits to dispose of fish entrails. The program is treating eligible water sources in the camp and nearby areas with Abate, as well as providing health education about the disease and filters (cloth and pipe) to the inhabitants. Seventy-two trained volunteers/health workers conduct active surveillance in the PRC. Ethiopia has reported one confirmed Guinea worm case in a human (contained; presumed source known) and the one provisional cat infection so far in 2021 but no dog or baboon infection. In 2015-2020, 48 of 54 dog infections in Ethiopia were detected in May-September. In 2013-2020, 16 of the 19 infected baboons were detected in June-August, and in 2012-2020, 40 of the 46 human cases occurred in April-October.

ANGOLA



In September, Angola's Guinea Worm Eradication Program continued to monitor progress and expand community-based surveillance in areas at risk. It conducted supervisory visits to four municipalities, including three endemic (Namacunde, Cuvelai, Cuanhama) and one non-endemic (Ombadja). More than 3,360 community members were sensitized in 17 villages and cloth filters were provided to 403 families. The program responded to three rumors of human cases and one rumor of an animal infection, none of which were confirmed as Guinea worm. The program also disseminated Guinea worm messages in cooperation with other programs such as Covid-19 vaccination and the United Nations Family Planning Agency (UNFPA). Ms. Giovanna Steel of The Carter Center assisted in training 20 health professionals and workers in use of Abate.

In October, the program made community-based supervision and surveillance visits to 6 additional villages in areas at risk level 2-3. A total of 30 people was trained, including 21 new community health workers and 9 health workers. Additionally, 1 rumor of a human case was investigated and discarded. The country is preparing to receive a WHO technical support mission (end of October to mid- December 2021) on strengthening vector control interventions.

ICCDE



**World Health
Organization**

The International Commission for the Certification of Dracunculiasis Eradication (ICCDE) met virtually for three hours on October 12, 2021, under the chairmanship of Dr. Joel Breman. The meeting heard updates on the status of priority certification preparations for the **Democratic Republic of Congo** (DRC), which has not reported a case of Guinea worm disease since 1958, and **Sudan**, which reported its last indigenous case in 2013. The commission also heard updates on the status of Guinea worm infections in the five endemic countries, surveillance in Cameroon and Central African Republic, and related research.

Since 2014, the DRC's Guinea Worm Eradication Program has conducted extensive case searches itself and in cooperation with other mass vaccination or mass drug administration programs, reaching 64,0500 villages covering almost the entire country by 2018. Only North and South Kivu Provinces were not covered by searches due to insecurity, but other evidence gathered by the polio program and GWEP monitoring visits reveals no evidence of Guinea worm disease in those provinces either. The DRC's National Commission for Guinea Worm Eradication submitted a first draft of its Country Report to the ICCDE in 2019 and the final Country Report in December 2020. The ICCDE hopes to send an

International Certification Team to the DRC and complete the country’s dossier for consideration by the ICCDE in the first quarter of 2022.

Sudan has continued routine, community-based, and other Guinea worm surveillance, with emphasis on former endemic areas, at-risk border areas, entry points from bordering countries (especially endemic Chad, Ethiopia, and South Sudan), refugees, and camps for internally displaced persons. It has investigated 24 rumors so far in 2021. Sudan is revising its draft Country Report. Insecurity, insufficient funding and surveillance, as well as health system weaknesses are key challenges. Sudan’s goal is to submit its revised Country Report to the ICCDE in the first quarter of 2022, and be visited by an International Certification Team in the second or third quarter of 2022.

Figure 3
Distribution of 11 Confirmed Cases of Dracunculiasis Reported January-September 2021



Table 2

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2021* (Countries arranged in descending order of cases in 2020)														
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 [^]	0/0	1/1	1/1	1/2	0/0	0/0	1/2	0/0	0/0	/	/	/	4/6	67%
ETHIOPIA	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	/	/	/	1/1	100%
SOUTH SUDAN	0/0	0/0	0/0	0/0	0/0	0/0	1/2	0/0	0/0	/	/	/	1/2	50%
ANGOLA	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	/	/	/	0/0	N/A
MALI	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	1/1	/	/	/	1/2	50%
TOTAL*	0/0	2/2	1/1	1/2	0/0	0/0	2/4	0/1	0/0	0/0	0/0	0/0	7/11	64%
% CONTAINED		100%	100%	50%			100%	0%						
<i>*Provisional</i>														
	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.													
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	0/2	0/3	1/2	2/2	0/0	0/1	0/1	0/0	1/1	0/0	0/0	5/13	38%
SOUTH SUDAN	0/0	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0	1/1	100%
ANGOLA	0/0	0/0	0/1	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	7/7	0/0	0/0	0/0	2/2	1/1	1/1	0/0	0/0	11/11	100%
MALI §	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0%
TOTAL	1/1	0/2	0/5	8/9	2/2	0/0	1/2	2/3	1/1	2/2	0/0	0/0	17/27	63%
% CONTAINED	100%	0%	0%	89%	100%	100%	50%	67%	100%	100%	100%	100%	63%	
	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. The GWEP continued to deploy one technical advisor to Kidal Region to oversee the program.														
[^] Cameroon reported one case in February that was most likely infected in Chad.														

RECENT PUBLICATIONS

World Health Organization, 2021. Monthly report on dracunculiasis cases, January-May 2021. Wkly Epidemiol Rec 96(37):458-459.

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 H24-3 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