

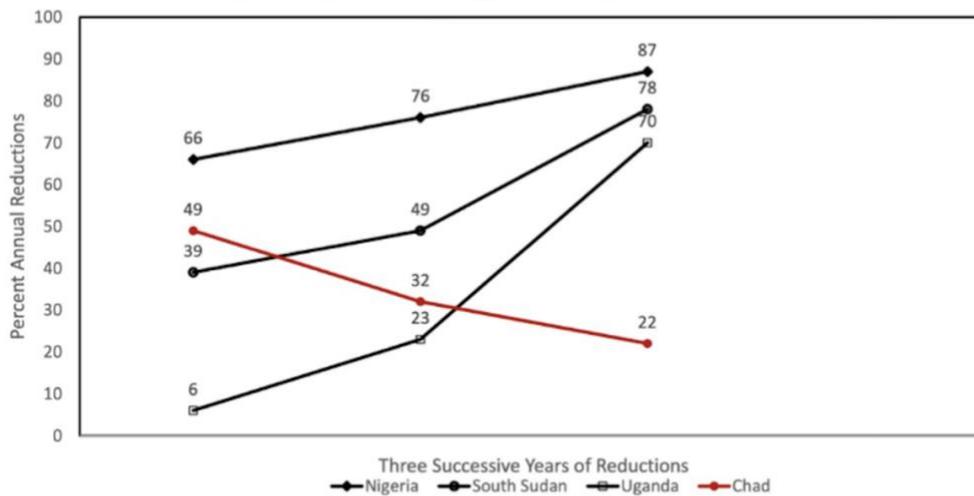


Date: January 17, 2024
From: WHO Collaborating Center for Dracunculiasis Eradication, CDC
Subject: GUINEA WORM WRAP-UP #305
To: Addressees

***DETECT** immediately! **CONTAIN** completely! **SOURCE** specifically!*

Figure 1:

Percent Annual Reductions in Guinea Worm in Chad, Nigeria, South Sudan, and Uganda from Approximately 1500 Cases or Infections.



Three Successive Years of Reductions
 ● Nigeria ● South Sudan ▲ Uganda ◆ Chad

Nigeria (human cases): 1,459 (2003); 495 (2004); 120 (2005); 16 (2006)
 South Sudan (human cases): 1,698 (2010); 1,028 (2011); 521 (2012); 113 (2013)
 Uganda (human cases): 1,455 (1996); 1,374 (1997); 1,061 (1998); 321 (1999)
 Chad (dog infections): 1,508 (2020); 767 (2021); 521 (2022); 407* (2023)

*Provisional

CHAD: FOCUS ON VILLAGES WITH GUINEA WORM



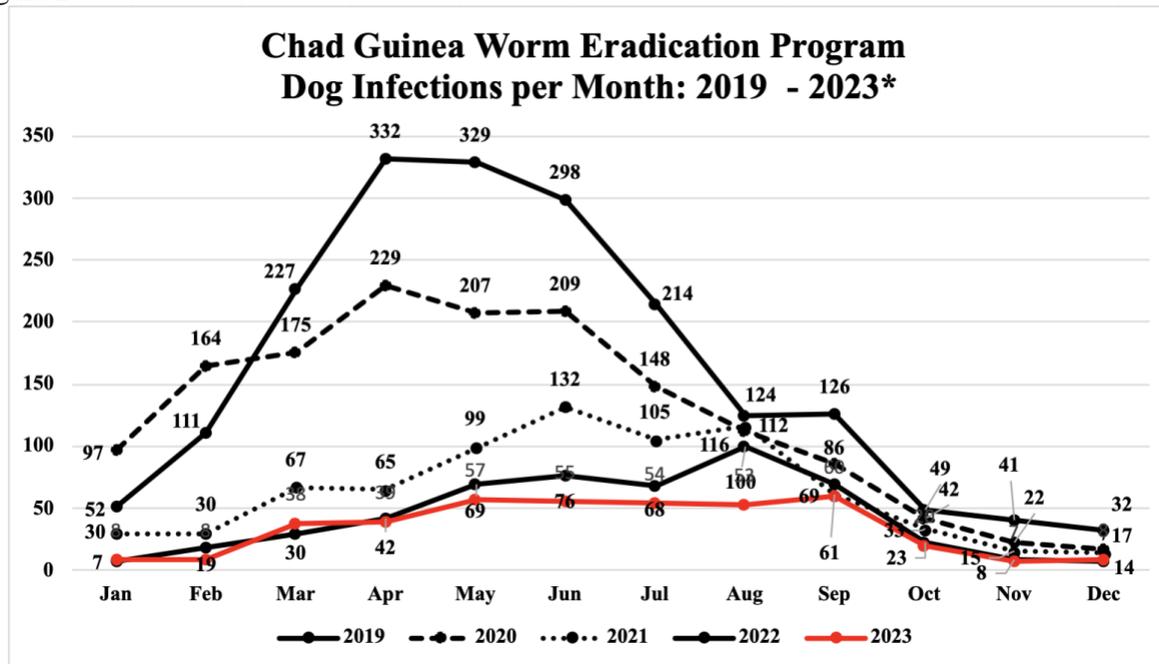
While Chad’s continued reduction of infected dogs is encouraging and commendable, the CGWEP’s lower rates of reduction in dog infections in recent years is less so. In most other endemic countries, the rates of reduction *increased* each year after it reported about 1500 human GW cases, due to increased efficiency as the number of endemic villages decreased, but Chad’s annual reductions in dog GW infections have *decreased* in recent years (Figure #1) even though Chad only had about half (-45%) as many villages with GW infections in 2022 as it had

in 2019. Although *some* of the interventions to prevent GW transmission in humans and animals are different, the principle that rates of reduction should *increase*, not decrease, as programs become more efficient with fewer cases and/or infections and fewer endemic communities, is still valid. As reported in last month's issue, in 2022 about one-third (39%) of Chad's villages with infected dogs reported over two-thirds (71%) of all infected dogs. *Chad's GWEP can increase its impact by focusing surveillance and interventions on villages with 2 or more infected dogs, with extra-special attention to fishing villages, villages near international borders, and villages without safe drinking water.*

Chad's Guinea Worm Eradication Program (CGWEP) has reported a provisional total of 407 dogs (79% contained), 89 cats (64% contained), and 9 humans (67% contained) with Guinea worm infections in 276 villages in January-December 2023. This is Chad's fourth consecutive year of reduced dog infections since the CGWEP reported a peak of 1,935 dog infections in 422 villages in 2019 (Figure #2).

The annual number of human GW cases reported in Chad ranged between 6 and 26 in 2019-2023 (avg. 12 per year), excluding 22 cases in a water-borne outbreak at Bogam village in 2019. Evidence to date increasingly supports the hypothesis that most human and animal GW infections in Chad result from eating under-cooked aquatic animals such as fish.

Figure 2:



With the objective to boost and improve Guinea worm disease surveillance quality, CGWEP National Program Coordinator Dr. Ouakou TCHINDEBET and Deputy National Coordinator Dr. Ali Haggag YOUSOUF visited Guinea worm endemic provinces over a three-week period in December 2023. Carter Center Vice President for Overseas Operations Craig Withers, MBA, MHA, made a supportive visit to Chad in early December 2023.

SOUTH SUDAN



The South Sudan Guinea Worm Eradication Program (SSGWEP) held its 18th Annual Review Meeting on December 12-13, 2023, at the Palm Africa Hotel in Juba. The Honorable Aya Warille, Minister of Gender, Child and Social Welfare, who was Acting Minister of Health, opened the meeting, which was chaired by Director General for Preventive Health Services Dr. John Rumunu. SSGWEP Director Mr. MAKOY Samuel Yibi gave an overview of the status of the SSGWEP and led much of the

discussion. More than 75 participants attended the meeting, including director generals from each state ministry of health and SSGWEP senior program officers, the WHO representative in South Sudan Dr. Fabian Ndenzako, and UNICEF resident representative Ms. Hamida Laseko. Participants from The Carter Center included GWEP Director Adam Weiss, Sarah Yerian, Giovanna Steel, and others.

The SSGWEP has provisionally reported 3 Guinea worm infections in 2023: 2 human cases in Tonj East County of Warrap State and 1 infection in a genet in Lafon County of Eastern Equatoria State. All three infections were uncontained, and their sources of infection are unknown. South Sudan reported 6 GW infections in 2022 (5 humans, 1 dog) and 4 GW infections in 2021 (4 humans).

Figure 3:



On December 3rd, SSGWEP Director MAKOY Samuel Yibi participated as a panelist at the Last Mile Forum in Dubai, United Arab Emirates. The panel was entitled: Building Climate Resilient Health Systems, and Mr. Makoy discussed adaptations to climate in the SSGWEP (Figure #3).

MALI: 1 HUMAN CASE, 48 ANIMAL INFECTIONS



Mali has reported a confirmed Guinea worm case (uncontained) in a 9-year-old Bozo boy from the village of Gomitogo in Djenne district of Mopti Region, whose worm emerged on August 27, 2023. (The CDC laboratory confirmed this GW infection in December). The presumed source of his infection is local, but unknown, since the boy had no history of travel to an endemic area during his period of infection, and the most recent known infection in Gomitogo was in 2019. Different teams from Mali's Guinea

Worm Eradication Program (MGWEP) who visited the child and his family at a seasonal fishing camp in September and November 2023 reported there is no source of safe drinking water in the camp. The MGWEP applied appropriate interventions, including Abate, after the suspect case was detected on August 26.

The MGWEP also reported a provisional total of 48 animal infections (73% contained; 42 dogs, 5 cats, 1 donkey) in 2023, compared to 39 dogs and 2 cats in 2022. Macina district in Segou Region produced 66% of Mali's animal infections in 2022-2023, Markala district/Segou Region and Djenne district/Mopti Region had 12% and 11% respectively, while Tominian district/Segou had 7%. Mali began proactive tethering late in 2021 and expanded it in 2022, when Djenne and Macina districts proactively tethered 328 dogs and 63 dogs, respectively, in July-December. In November 2023 the 7 localities responsible for most animal infections in the first 3 districts *proactively tethered* 99% of 928 targeted dogs and 93% of 1,038 targeted cats. Surveys in November 2023 showed *proper disposal of fish guts* in 96% (491/513) of households and 92% (23/25) of fish sellers in Macina district and 80% (450/563) of households visited in Markala district. Surveys in October 2023 showed proper fish gut management in 56% (14/25) of households and 58% (7/12) of fish sellers visited in Djenne district. Mali routinely *applied Abate* in appropriate areas of Macina, Markala, and Djenne districts as a preventive measure and after a likely contamination of water sources. *Hotspot: Macina, Markala, Djenne, and Tominian districts.*

IN BRIEF

Ethiopia's next round of live baboon trapping is scheduled for March 2024. Giovanna Steel, MA, and Drs. Obi Eneanya and Lexi Sack conducted a supervisory visit to Ethiopia in early December to help finalize plans for trapping and studying baboons and assess the status of program interventions. Ethiopia reported one GW infection, in a dog, in 2023.

CHAD AND MALI: SIMILAR BUT DIFFERENT

The Guinea Worm Eradication Programs in Chad and Mali face a *similar riverine ecology* in their main endemic areas along the Chari River and the inland delta of the Niger River, respectively, and the *same hypothesis of novel Guinea worm transmission* to humans and animals eating raw or under-cooked aquatic animals such as fish is believed to apply in both countries. In 2019-2023 however, Chad had 46 times as many GW infected dogs as Mali (5,131:112) and 15 times as many human GW cases as Mali (60:4), despite greater insecurity and uniquely significant interregional transport and marketing of dogs in Mali. Chad, with 29,392 dogs eligible for proactive tethering in 2022, has year-round GW transmission which peaks in May-June, vs. about six months transmission in Mali. Why the big difference in GW transmission in Chad and Mali? In theory, some of the difference in numbers of GW infections between the two countries could be due to differences in sensitivities of the national surveillance systems.

Three ecological features stand out. Although community-based seasonal collective fishing has been practiced widely in Chad for many generations, since 2012 dog GW infections in Chad have peaked at the end of the dry season, almost at the same time as collective fishing. Community-based collective fishing is less common in Mali. Also, Chad's estimated annual commercial fish production is nearly three times that of Mali (130 thousand tons vs. 47 thousand tons). Additionally, Chad reportedly has many more dogs than Mali. Some change in climate and/or fishing practices (e.g., use of smaller mesh fishing nets that capture smaller, copepod-feeding fish) may have combined with the above factors to produce Chad's recent "peculiar" Guinea worm epidemiology.

	<u>Chad</u>	<u>Mali</u>
<u>Surveillance</u> (2022)		
Villages under Active Surveillance	2,434	2,216
Endemic area reward awareness	72%	82%
<u>Interventions</u> (2022)		
Safe water in 1+ villages	64%	100%
Abate application	95%	100%
	(of 331 villages 1+)	(of 37 villages)
Proactive tethering began	March 2020	November 2021
Estimated proper fish waste disposal	53%	55%

Mali's greater coverage with safe water in known endemic villages reduces the risk of traditional water-borne GW outbreaks in humans, but if water-borne transmission were the main mode of contracting infection in humans in Chad and Mali, there would have been more common-source outbreaks in humans. Chad averaged only 12 human cases per year in 2019-2023, with one large water-borne point-source outbreak in Bogam in 2019, while Mali had only 4 human cases in 2019-2023 and its most recent outbreak in humans was at Tanzikratene in 2014. The low-level dispersed transmission to humans in Mali and Chad suggests the alternative food-borne mode of transmission is the usual mode, especially among persons with no known epidemiological links to other human GW cases. In addition to several small human case clusters detected during this timeframe that may have resulted from water-borne exposure, the more frequent

human GW cases in Chad may be due to greater environmental contamination by fish waste containing GW larvae. Such environmental contamination increases dogs' exposure to infective discarded fish and fish guts, and the risk of human exposure to contaminated aquatic animals such as undercooked fish. Reducing the number of infected dogs should reduce the amount of GW larvae in the environment available to infect human and animal hosts in Chad, which reported over half (34/66) of all human cases worldwide in 2020-2023.

Figure 4:

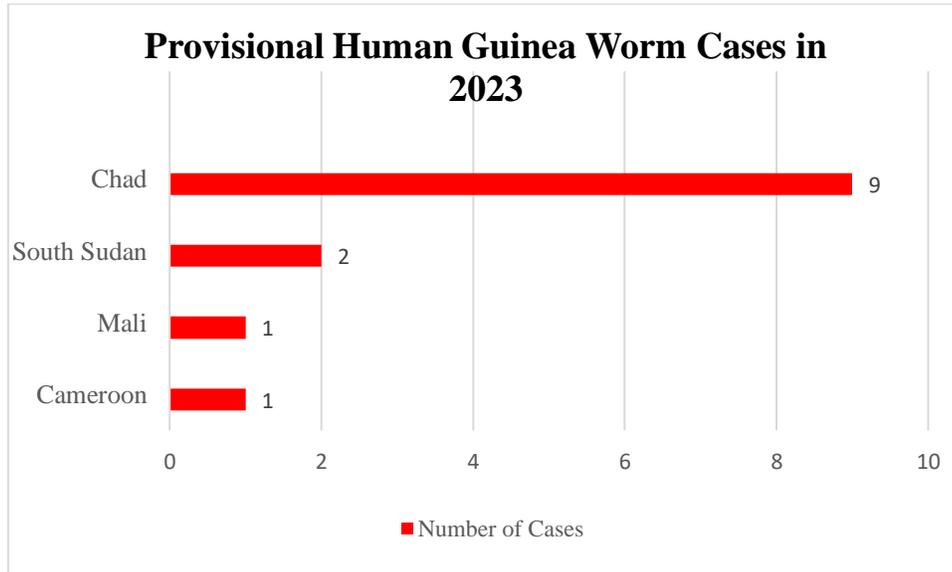


Figure 5:

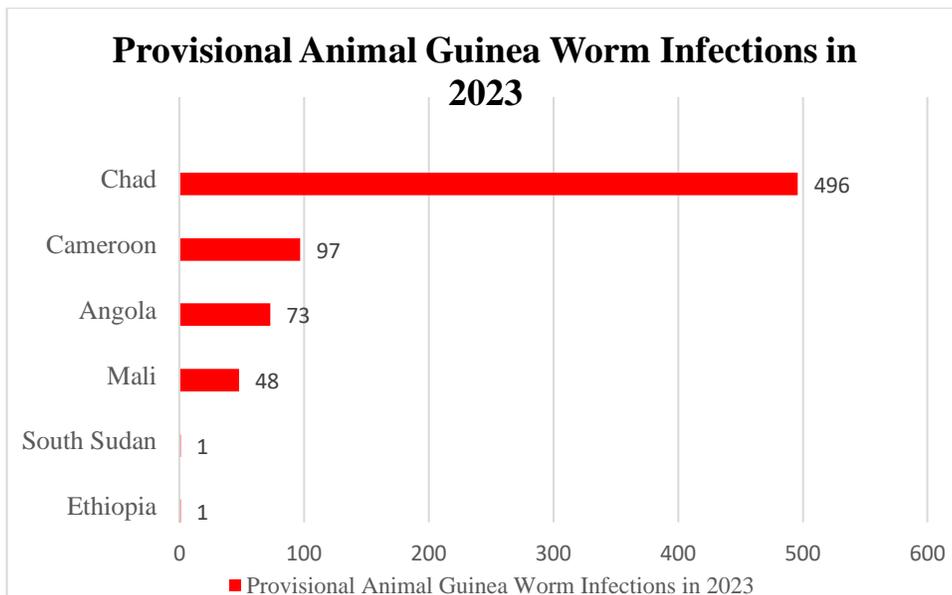


Table 1

Number of Laboratory-Confirmed Human Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2023*														
(Countries arranged in descending order of cases in 2022)														
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	0/0	0/0	0/0	1/1	1/1	1/3	1/1	1/2	1/1	0/0		6/9	67%
SOUTH SUDAN	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/1	0/0	0/0		0/2	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	N/A
CENTRAL AFRICAN REPUBLIC	0/0	0/0	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	0/0	0/0	0/0		0/1	0%
CAMEROON	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0		1/1	100%
TOTAL*	0/0	0/0	0/0	0/0	2/2	1/1	1/3	1/3	1/3	1/1	0/0		7/13	54%
% CONTAINED	N/A	N/A	N/A	N/A	100%	100%	33%	33%	33%	N/A	N/A	N/A	54%	
<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.														
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	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL	
CHAD	0/0	1/2	0/0	0/0	0/0	0/1	0/1	1/2	0/0	0/0	0/0	0/0	2/6	33%
SOUTH SUDAN	0/0	0/0	0/0	0/0	0/0	0/0	0/1	1/1	1/2	1/1	0/0	0/0	3/5	60%
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	N/A
ETHIOPIA	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	1/1	100%
CENTRAL AFRICAN REPUBLIC	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%
CAMEROON	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	N/A
TOTAL	0/0	1/2	0/0	0/0	0/0	0/1	1/3	2/3	2/3	1/1	0/0	0/0	7/13	54%
% CONTAINED	N/A	50%	N/A	N/A	N/A	0%	33%	67%	67%	100%	N/A	N/A	54%	
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Are the right people receiving the *Guinea Worm Wrap-Up*?

We remind leaders of National Guinea Worm Eradication Programs to make sure all appropriate persons are receiving the *Guinea Worm Wrap-Up* directly, by email. With frequent turnover of government officials, representatives of partner organizations, and recruitment of new Guinea worm program staff, keeping desired recipients up to date is challenging. Frequent review of who is receiving the newsletter directly is advised. To add an addressee, please send their name, title, email address, and preferred language (English, French, or Portuguese) to Dr. Sharon Roy at CDC (gwwrapup@cdc.gov).

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, Adam Weiss, and Dr. Ernesto Ruiz-Tiben of The Carter Center, Dr. Sharon Roy of CDC, and Dr. Dieudonné Sankara of WHO. Formatted by Yujing Zhao and Jacqueline Mullen.

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Back issues are also available on the Carter Center web site in English, French, and Portuguese and 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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