

Memorandum



**Date:** April 30, 2024

**From:** WHO Collaborating Center for Dracunculiasis Eradication, CDC

**Subject:** GUINEA WORM WRAP-UP #308

**To:** Addressees

*Are you working to make things happen, or waiting to see what happens?*

## TWO MINISTERS & UNDERSECRETARY JOIN 27<sup>th</sup> INTERNATIONAL REVIEW

THE  
CARTER CENTER



World Health  
Organization

Mali's Minister of Health, Col. Assa Badiallo Toure; Cameroon's Minister of Health, Dr. Malachie Manaouda; and South Sudan's Undersecretary of Health, Mr. Ader Macar Aciek, joined over 130 participants at the 27<sup>th</sup> Annual International Review Meeting of Guinea Worm Eradication Program Managers that was held at The Carter Center in Atlanta, Georgia USA on April 17-19, 2024. This was the first in-person international program review since 2019. Ethiopia Public Health Institute Director-General Mesay Hailu, the National Program Coordinator of Chad's GWEP Dr. Ouakou Tchindebet, the National Coordinator of Angola's GWEP Dr. Maria Cecilia, National NTD/GWE Coordinator of Cameroon, Dr. Nko' Ayissi Georges Barthélémy, and Central African Republic's NTD/GWE Coordinator, Dr. Bernard Boua, led their country's respective delegations to the meeting. Other representatives included the Unit Head, Preventive Chemotherapy Dr. Daniel Dagne, Eradication/Elimination Team Lead Dr. Dieudonne Sankara, and Data Manager Ms. Farah J. Agua from World Health Organization headquarters; Dr. Andrew Seidu Korkor, Focal Point for Guinea Worm Eradication at WHO's Regional Office for Africa; WHO Country Representative for Cameroon Dr. Phanuel Habimana; WHO NTD/GWE Focal points of Angola, Cameroon, Central African Republic, Chad, Ethiopia, Mali and South Sudan, as well as the GWE Focal Point in Sudan, Elrofaay Mohammed. Carter Center Chief Executive Officer Paige Alexander, Vice President for Health Programs Dr. Kashef Ijaz, GWEP Director Adam Weiss, MPH, and Special Advisor for GWE Dr. Donald Hopkins led the large Carter Center team at the meeting.

This first in-person international review meeting since 2019 was exceptional for its high-level political participants and its large size. It follows endemic countries' vows to increase political support for their Guinea Worm Eradication Programs in the March 2022 Abu Dhabi Declaration; visits by the respective Ministers of Health of Ethiopia (May 2022), South Sudan (April 2023), and Chad (June 2023) to endemic areas of their countries; and the February 2024 Declaration of

N'Djamena in which the governors of eight endemic provinces pledged “concrete action” to help eliminate Guinea worm from Chad.

According to final data presented at the review, Angola, Cameroon, Central African Republic, Chad, Ethiopia, Mali, and South Sudan reported a total of 14 human Guinea worm cases and 886 animal infections, including 784 dogs, in 352 villages in 2023 (Table 1). This represented a slight increase in human cases, from 13 cases in 2022, and a 29% increase from the 686 animal infections reported in 2022. The increase in reported animal infections in 2023 is mainly due to approximately ten-fold increases in Cameroon (from 28 in 2022 to 258 in 2023), and Angola (from 7 in 2022 to 85 in 2023). Some of Cameroon and Angola’s recent increases may be due to improved surveillance. No human case was reported for six months in 2022 (January, March-May, November-December) and in 2023 (January-April, November-December). A highlight of presentations on recent research featured an informative update on Guinea worm population genomics by Dr. Elizabeth Thiele and Dr. Jessica Ribaldo. Details of the country reports are summarized below.

Table 1. Guinea Worm Infections, 2023

	Human Cases	Animal Infections	Dogs	Villages	Guinea Worms
<b>Angola</b>	0	85	85	30	99
<b>Cameroon</b>	1	258	251	16	461
<b>Chad</b>	9	494	406	277	899
<b>Ethiopia</b>	0	1	1	1	1
<b>Mali</b>	1	47	41	16	56
<b>South Sudan</b>	2	1	0	3	3
<b>Central African Republic</b>	1	0	0	1	2
<b>TOTAL</b>	14	886	784	344	1,521

### CHAD: 22% FEWER INFECTED DOGS IN 2023



The National Program Coordinator, Dr. Tchindebet Ouakou, reported on Chad’s GWEP. Chad reported 9 human cases of Guinea worm disease (67% contained), 406 dogs (79% contained), and 88 cats (64% contained) with Guinea worm infections in 2023, in 277 villages, of which 120 villages also reported Guinea worm infection in 2022 (Two of the cats reported by Chad were wild cats; a third wild cat had an un-emerged GW and is not included since it did not meet the case definition. All 3 wild cats were detected in June 2023). These represent a 50% increase in human cases, a 22% reduction in dog infections, and a 4% increase in cat infections from the 6 human cases (33% contained), 521 infected dogs (70% contained), and 85 infected cats (65% contained) reported in 2022. The total number of emerged Guinea worms detected in Chad in January-December 2023 declined to 899 from 1,102 in the same period of 2022 (Table 1). Population genomics suggests that genetic diversity of Guinea worms in Chad remains high. *By producing a lot of potentially infective fish waste in a brief period, annual seasonal mass fishing may heighten animal Guinea worm infections in Chad.* Four of Chad’s 9 human cases in 2023 occurred in one family in Balwai 1 village of

Korbol district, Moyen Chari Province and 5 of the 9 cases were  $\leq 14$  years old. Balwai 1, a fishing village, has no source of safe drinking water and there was no known Guinea worm case or animal infection in the village in 2022. The status of surveillance for Guinea worm in Chad in 2023 is summarized in the Surveillance Snapshot below.

Chad's GWEP implemented prolonged tethering of dogs and cats in an average of 94% of 1+ villages (GW reported in 2023 and/or 2022) during 2023, thereby constraining the movements of 81% of eligible dogs and 80% of eligible cats in those villages. An average 62% of households in Villages under Active Surveillance had repositories for safe disposal of fish guts and an average 43% of households in 1+ villages used them. Abate was applied in an average 90% of 1+ villages in 2023 (Figure 1). However, it emerged during discussion that Chad's GWEP has not routinely monitored the effectiveness of Abate treatments, and it was urged to begin doing so immediately.

Chad has reported provisional totals of 43 infected dogs (70% contained) and 2 infected cats (50% contained) in January-March 2024, which is a reduction of 20% from 54 dogs (69% contained) and 2 cats (100% contained) reported in the same period of 2023. Chad reported no human GW infections in January-March 2024 or January-March 2023.

### **Chad GWEP Surveillance Snapshot 2023**

Accessibility: 99%

Villages reporting 1+ GW infection: 277

Number of districts by surveillance level: 35 in level 1; 4 in level 2 (concurrently in level 1); 123 in level 3

Villages under Active Surveillance (VAS): 2,768 (2,657 level 1; 111 level 2)

Monthly reporting rate for VAS: 100%

Number of rumors: humans 180,609 (96% investigated in 24h), animals 105,268 (98% investigated in 24h)

Cash reward awareness: 70% humans, 70% animals

Integrated surveys: None

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): N/A

% presumed sources of human cases identified\*: 44%

% human and animal Guinea worm infections contained: 76%

\*see definition on page 11

### **MALI: GWEP CONSTRAINED BY INSECURITY**



National Program Coordinator Dr. Cheick Oumar Coulibaly presented Mali's report. Mali's Guinea Worm Eradication Program reported 47 animal infections (77% contained), including 41 dogs (32 contained), 5 cats (4 contained), and 1 donkey (not contained), and 1 uncontained human Guinea worm case in 2023. (Mali has reported only 4 human cases in 2016-2024). Thirty-nine (83%) of the 47 infections appear to have been indigenous, but *mass transport of dogs between Mopti and Segou Regions in Mali's commercial trade in dogs for consumption fosters GW transmission*. The human case occurred in Gomitogo village (Djenne district), where the most recent known Guinea worm infection was in August 2019. Three animal infections and the human case occurred in Mopti

Region (3 in Djenne district, 1 in Mopti district); the other infections were in Segou Region: 32 in Macina district, 9 in Markala, 2 in Tominian, and 1 in San. Genetic analysis suggests Mali is missing several uncontained Guinea worm infections.

All 24 villages that reported a Guinea worm case or infection in 2022 - 2023 had at least one source of safe drinking water and received health education, and 92% were treated with Abate. Seven villages (29%) practiced proactive tethering in 2023, with plans to add 2 more endemic villages (→38%) in 2024, and 7 villages (29%) practiced safe disposal of fish guts (Figure 1). Insecurity limited Mali GWEP's ability to implement interventions, especially proactive tethering, Abate, and safe fish gut management in some endemic communities. The effective Peace through Health Initiative, which began in 2020 and now includes parts of Tenenkou, Youwarou, Macina, and Tominian districts, could potentially help secure access to the remaining priority endemic areas.

### **Mali GWEP Surveillance Snapshot 2023**

Accessibility: 89%

Villages reporting 1+ GW infection: 24

Number of districts by surveillance level: 5 in level 1; 3 in level 2; 67 in level 3

Villages under Active Surveillance (VAS): 1,965 (1,130 level 1; 835 level 2)

Monthly reporting rate for VAS: 100%

Number of rumors: humans 255 (100% investigated in 24h), animals 802 (99% investigated within 24h)

Cash reward awareness: 84% humans, 81% animals

Integrated surveys: 38,405 (immunization campaigns)

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 1,515 (94%)

% presumed sources of human cases identified\*: 0%

% human and animal Guinea worm infections contained: 75%

\*see definition on page 11

### **ETHIOPIA: GETTING CLOSE**



National Program Coordinator Mr. Kassahun Demissie presented the report of the Ethiopia Dracunculiasis Eradication Program (EDEP). Ethiopia had one Guinea worm infection in a domestic dog (contained) in 2023, as well as a confirmed infection in a dead serval cat about 35 km (~22 miles) away (aerial distance) that had a confirmed Guinea worm that was un-emerged and thus did not meet the official definition of a case but was fully contained. The sources of both infections are unknown. All appropriate interventions were implemented for both animals. The status of EDEP surveillance and interventions are summarized in the Surveillance Snapshot below and in Figure 1. Genomic analysis of Guinea worms from recent infections in different hosts suggests the EDEP is not detecting some uncontained GW infections. Inadequate safe drinking water for daily laborers on commercial farms is a major risk for a point source GW outbreak in Ethiopia.

*This program's aggressive use of proactive tethering, Abate application (with impact monitored routinely), and active surveillance of humans, dogs, cats, and baboons in the small endemic area*

*remaining may soon stop GW transmission. Trapping and examining baboons in the endemic area in June-July 2024 during the peak transmission season will be especially instructive.*

### **Ethiopia EDEP Surveillance Snapshot 2023**

Accessibility: 100%

Villages reporting 1+ GW infection: 2

Number of districts by surveillance level: 2 in level 1; 15 in level 2; 1,206 in level 3

Villages under Active Surveillance (VAS): 1,144 (199 level 1; 945 level 2; Non-Village Areas under Active Surveillance (NVAs): 315 (229 level 1; 86 level 2)

Monthly reporting rate for VAS: 100%

Number of rumors: humans 28,313 (99% investigated in 24h), animals 6,976 (100% investigated in 24h)

Cash reward awareness: 98% humans, 95% animals (level 1 areas)

Integrated surveys: 189,493 people (mass drug administration; measles, HPV, COVID-19 immunization)

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 21,809 (83%)

% presumed sources of human cases identified\*: N/A

% human and animal Guinea worm infections contained: 100%

\*see definition on page 11

### **SOUTH SUDAN: SPARSE INFECTIONS**



Mr. Samuel Yibi MAKROY, the Director of South Sudan's GWEP, presented the report on his country's program. South Sudan reported 2 human cases of Guinea worm disease and 1 Guinea worm infection in a wild genet in 2023. None of the three infections was contained, and no presumed source was identified for any of them. The two human cases, young males 13 and 4 years-old, live about 5 km (3 miles) apart in Tonj East County of Warrap State. Their single worms emerged in August and September 2023, respectively. Epidemiological investigation suggests the two patients may have been infected from the same unknown source. The SSGWEP suspects these two human cases were infected by drinking water from isolated water bodies around their home villages or cattle camps where the patients spent most of their time in the 10-14 months before their worms emerged, and that the water was contaminated by missed human or animal infection(s). Genetic analysis of their Guinea worms is pending. The infected genet was found in November about 300 miles (~500 km) away in Lafon County of Eastern Equatoria State. This is the first wild animal found with GW infection in South Sudan, and it follows two domestic dogs, one of which was detected in the same household as a human GW patient in Jur River County of Western Bahar Al Ghazal State in September 2015, and the other in Tonj East County in August 2022, as the only GW infections detected in animals in South Sudan.

South Sudan has reported an average of only about 4 human GW infections per year (range: 0-10 cases/year) since 2015, mostly solitary cases with a few small outbreaks. The pattern of sparse unexpected cases discovered in areas without recent known endemicity, often among persons with migratory lifestyles, has persisted in South Sudan for almost a decade. Genomic analysis of Guinea worms from recent infections suggests the SSGWEP is missing some uncontained infections, but

whether among humans, domestic animals, wild animals, or some combination, is unknown. The status of SSGWEP surveillance and interventions are summarized in the Surveillance Snapshot below and in Figure 1. The SSGWEP engages communities to bury or burn fish guts.

### **South Sudan GWEP Surveillance Snapshot 2023**

Accessibility: 100%

Villages reporting 1+ GW infection: 3

Number of counties by surveillance level: 3 in level 1; 14 in level 2; 63 in level 3

Villages under Active Surveillance (VAS): 603 (220 level 1; 383 level 2) [1,866 level 3]

Monthly reporting rate for VAS: 99%

Number of rumors: humans 150,192 (99% investigated in 24h), 10,045 animals (99% investigated in 24h)

Cash reward awareness: 93% humans, 89% animals (level 1 areas)

Integrated surveys: Integrated GW awareness and case searches during food distribution and polio immunization campaigns, especially in risk level 2 and 3 counties

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 87%

% presumed sources of human cases identified\*: 0%

% human and animal Guinea worm infections contained: 0%

\*see definition on page 11

### **CAMEROON MOBILIZES VS. INCREASED INFECTIONS**



National Program Coordinator Dr. Georges Barthelemy NKO'AYISSI reported on the status of Cameroon's Guinea Worm Eradication Program. Cameroon's Minister of Health Dr. Malachie Manaouda led his country's delegation to this international program review, accompanied by WHO's Country Representative to Cameroon, Dr. Phanuel Habimana.

After Cameroon eliminated Guinea worm disease in 1997, the World Health Organization certified the country as free of GWD in 2007. Cameroon detected three human Guinea worm cases and multiple dogs with Guinea worm infections in Guere health district of Extreme North Region between 2019 and 2022, an area adjacent to Chad's endemic Bongor district, where extended families live and share markets on both sides of the international border. The World Health Organization assisted Cameroon's investigations and control measures beginning in 2019, joined later by The Carter Center. The number of reported dog infections increased from 10 in 2021 to 28 in 2022, then to 251 infected dogs and 7 infected cats detected in 16 villages in 2023 (Table 2). Eighty-four percent (216/258) of the infected animals in 2023 were reportedly contained. Most (93%) of the infected animals in 2023 occurred in only 8 villages in Nouldaina sub-district of Guere health district. Genetic analysis of Guinea worms in this border area of Cameroon and Chad in 2023 suggests that the parasites form a single population, and that transmission is now endemic in Nouldaina sub-district of Cameroon. The affected area is fully accessible to the respective national GWEPs.

Cameroon's GWEP increased the number of Villages under Active Surveillance from 15 in 2022 all in Guere district to 26 in 2023 in Guere (24) and adjacent Yagona (2) health districts. It offers cash rewards of 100,000 CFA (~US\$165) for reporting a human case and 10,000 CFA

(~US\$16.55) for reporting an animal with Guinea worm infection. The GWEP did not assess the level of awareness of the cash rewards, but it responded to 226 rumors of GW in humans and 1,263 rumored infections in animals in 2023. In 2023 Cameroon's GWEP applied Abate in the top 11 (69%) of 16 villages with reported GW infections, began implementing proactive tethering in the top 10 villages, and distributed cloth and pipe filters in the top 9 villages. The program conducted additional training for Abate use in June 2023 and proactive tethering in July 2023, and it began helping communities construct pits for safe disposal of fish guts in July 2023. In the first quarter of 2024, the GWEP added three new technical advisors, raising the total to four, and engaged with Cameroon's CDC-sponsored Field Epidemiology Training Program to help investigate GW infections and cases.

### **ANGOLA NEEDS MORE HELP FAST**



Neglected Tropical Diseases National Coordinator Dr. Cecilia de Almeida presented Angola's report. Angola reported 85 dogs with GW infections in 2023, 5 reportedly contained (Table 2), in 29 villages, all in Cunene Province and mostly on the porous border with Namibia. These are among a total of 3 human cases and 93 infected dogs reported since GW was discovered in Angola in 2018. The program has increased the number of villages under active surveillance from 61 villages in 2022 to 158 in 2023- in Namacunde (103), Cuanhama (44), and Cuvelai (11) municipalities. It also conducted integrated surveillance for GW in cooperation with polio immunization and trachoma control efforts in 2023. Angola investigated 27 rumors of human cases and 122 rumored animal GW infections in 2023, 79% of them within 24 hours. Preliminary genetic analysis shows that nearly all Guinea worms examined from Angola share a unique bar code, suggesting that Angola's Guinea worm population probably expanded from a single source. The analysis also suggests multiple Guinea worm infections are being missed in Angola.

In 2023, Angola trained 171 workers to apply Abate and treated 94% of 262 water bodies, mostly in the off-peak period of June-December, and distributed cloth filters to 1,950 families. *Because the peak transmission season for Guinea worm in Angola is January-May, which is the rainy season when travel, logistics, and access to endemic areas are more difficult, the program must provide as much health education, training, supplies, and other interventions as it can during the dry season, which begins next month.* Angola detected 30 suspected GW infections in dogs in 19 villages in January-March 2024, but those specimens had not yet been shipped to CDC as of this report. The World Health Organization has assisted Angola's Guinea worm program and health authorities in adjacent Namibia since 2018. The Carter Center has provided limited assistance but cannot assist Angola fully until the Center's staff receive appropriate visas to formally open the office, which are currently being processed.

## DR. JOEL G. BREMAN (1936-2024), ICCDE CHAIRMAN

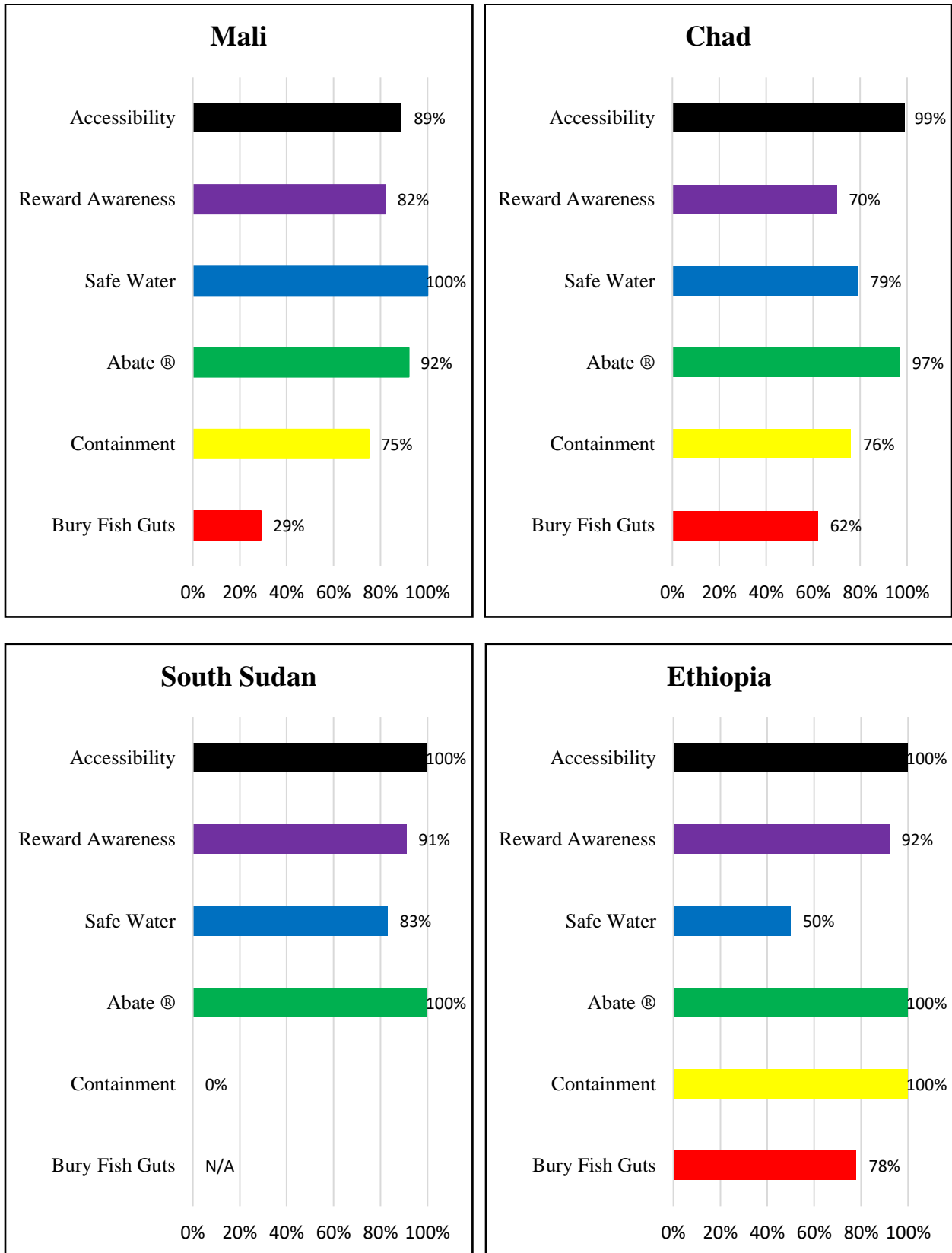


We greatly regret to report the passing of Dr. Joel Breman, the late chairman of the International Commission for the Certification of Dracunculiasis Eradication, on April 6, 2024. A graduate of the University of California at Los Angeles, Dr. Breman earned his medical degree at the University of Southern California in 1965 and a Diploma in Tropical Public Health at the London School of Hygiene and Tropical Medicine in 1971. His outstanding leadership and rich medical career at the U.S. Centers for Disease Control and Prevention, the World Health Organization, and the U.S. National Institutes of Health included experiences in mass vaccination and outbreak investigation of smallpox (Republic of Guinea and Burkina Faso), certification of smallpox eradication, pioneering investigation and control of the world's first outbreak of Ebola Hemorrhagic Fever in 1976 (Zaire, now the Democratic Republic of the Congo), promoting research and training in malaria, and certification of dracunculiasis (Guinea worm) eradication. The author of numerous medical publications, he served as the elected president of the American Society of Tropical Medicine and Hygiene in 2020.

Dr. Breman was one of the original twelve members of the International Commission for the Certification of Dracunculiasis Eradication (ICCDE) when the World Health Organization established that body under the chairmanship of Dr. Abdulrahman Al-Awadi of Kuwait in May 1995, and he succeeded Dr. Al-Awadi as chair in July 2019. His vigorous support of the ICCDE included serving as a leader of several International Certification Teams that visited Niger, Côte d'Ivoire, Ghana and Kenya and as a team member to some other countries to assess their preparedness for certification of eradication. As ICCDE chair, he employed all his accumulated public health experience, wisdom, and deep understanding of infectious diseases, as well as his calm demeanor, patience, and warm humor. We miss him and extend our profound condolences to his family.



Figure 1: Guinea Worm Eradication Program Indices Coverage for 2023



## MODIFIED INTERVENTION INDICES TO REFLECT VARIABLE MODES OF TRANSMISSION

With *D. medinensis* infections occurring in animals in the final six endemic countries and evidence mounting to suggest that the infection is being transmitted to humans and animals not just by drinking water, as before, but likely also by people and animals eating raw or undercooked transport hosts such as small fish (up to 2-3.inches/5-7.5 cm long) and/or raw fish guts, as well as perhaps by eating undercooked aquatic paratenic hosts such as frogs and larger fish, Guinea Worm Eradication Programs have adopted new interventions to counter the new challenges. Given this new situation we suggest that national GWEPs monitor a modified set of operational indicators. Among the former indicators, trained village volunteers, regular health education, and reporting by villages under active surveillance, including endemic villages, can be assumed as at or near 100%. Coverage with cloth filters protects against contaminated drinking water, such as in Ethiopia in 2017, but not against eating an infected transport or paratenic host, which may now be the most common mode of infection for humans and animals in Chad and Mali. The suggested indicators now are:

- Reward awareness. Combined results for VAS levels I & II (endemic and high-risk villages) for reporting human and dog infections: % aware of persons surveyed. *Detect infections quickly.*
- Containment of infected humans and animals. % of infected humans and animals contained or tethered. *Prevent contamination.*
- Abate coverage. % Cumulative villages where Abate applied this year in villages with infections in current or previous year. Water bodies may be ineligible for Abate treatment from time to time when they become too large (>1000mx3) or dry up. *Prevent infection and contamination.*
- Bury fish guts. % of people surveyed in VAS level I villages with demonstrated fish gut burial practice. *Prevent Infection.*
- Safe water source. % of VAS level I villages with at least one functioning source of safe drinking water. *Prevent large point source outbreaks.*
- Accessibility. % of VAS level I villages (endemic villages+) that are safely accessible by the program.

The latter indicator, as first reported on in GW Wrap-Up #257, is intended to estimate GW programs' safe access to areas of greatest concern now for supervision and interventions. After transmission is interrupted nationwide, the entire country will need to be accessible for adequate surveillance and certification. Our first concern now, however, is to stop transmission, which requires safe access. The four main considerations for the new indicator are: 1) the denominator = surveillance level 1 (known or suspected endemic) plus option to include other areas if judged appropriate; 2) scores are 0 = not accessible for supervision and interventions, 1 = partly accessible, 2 = fully accessible; 3) administrative level= district or county; 4) all GW infections count, whether human or animal. Total score is sum of scores for all districts/counties of concern divided by maximal score (2x total number of districts/counties of concern) times 100 = percentage. A country's score may change with changes in security situations on the ground.

## **DEFINITION OF A PRESUMED SOURCE OF GUINEA WORM INFECTION**

A presumed source/location of a human dracunculiasis case is considered identified if:

The patient drank unsafe water from the same source/location (specify) as another human case(s) or an infected domestic animal 10-14 months before infection, or

The patient lived in or visited the (specify) household, farm, village, or non-village area of (specify) a Guinea worm patient or an infected domestic/peri-domestic animal 10-14 months before infection, or

The patient drank unsafe water from (specify) a known contaminated pond, lake, lagoon or cut stream 10-14 months before infection.

If none of the above is true, the presumed source/location of the infection is unknown. Whether the patient's or animal's residence is the same as the presumed source/locality of infection or not should also be stated in order to distinguish indigenous transmission from an imported case.

## **DEFINITION OF A CONTAINED CASE\***

A case of Guinea worm disease is contained if all of the following conditions are met:

1. The patient is detected before or within 24 hours of worm emergence; and
2. The patient has not entered any water source since the worm emerged; and
3. A village volunteer or other health care provider has properly managed the case, by cleaning and bandaging until the worm is fully removed and by giving health education to discourage the patient from contaminating any water source (if two or more emerging worms are present, the case is not contained until the last worm is pulled out); and
4. The containment process, including verification that it is a case of Guinea worm disease, is validated by a supervisor within 7 days of the emergence of the worm and
5. ABATE is used if there is any uncertainty about contamination of sources of drinking water, or if a source of drinking water is known to have been contaminated.

\*The criteria for defining a contained case of Guinea worm disease in a human should be applied also, as appropriate, to define containment for an animal with Guinea worm infection.

Table 2														
<b>Number of <b>Dogs</b> with Guinea Worm Infections and Number Reported Contained by Month during 2023</b> (Countries arranged in descending order of infections 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	5 / 8	3 / 7	29 / 38	33 / 40	42 / 57	43 / 55	50 / 54	40 / 52	45 / 60	16 / 20	6 / 7	7 / 8	319 / 406	79%
MALI	0 / 0	0 / 0	0 / 0	0 / 0	3 / 3	4 / 4	0 / 1	5 / 7	12 / 16	7 / 9	1 / 1	0 / 0	32 / 41	78%
CAMEROON	15 / 16	41 / 43	40 / 55	54 / 62	28 / 34	17 / 18	16 / 17	2 / 3	0 / 0	0 / 1	0 / 1	0 / 1	213 / 251	85%
ANGOLA	0 / 0	0 / 2	0 / 36	1 / 26	1 / 14	1 / 4	0 / 1	1 / 1	0 / 0	0 / 0	0 / 0	1 / 1	5 / 85	6%
ETHIOPIA	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	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	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	N / A
TOTAL	20 / 24	44 / 52	69 / 129	88 / 128	74 / 108	65 / 81	66 / 72	47 / 62	57 / 76	23 / 30	7 / 8	8 / 10	570 / 784	73%
% CONTAINED	83%	85%	53%	69%	69%	80%	92%	76%	75%	77%	88%	80%	73%	
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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Table 3														
Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2024*														
(Countries arranged in descending order of cases in 2023)														
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	N/A
SOUTH SUDAN	0/0	0/0	0/0										0/0	N/A
CENTRAL AFRICAN REPUBLIC	0/0	0/0	0/0										0/0	N/A
CAMEROON	0/0	0/0	0/0										0/0	N/A
MALI	0/0	0/0	0/0										0/0	N/A
TOTAL*	0/0	0/0	0/0										0/0	N/A
% CONTAINED	N/A	N/A	N/A										N/A	
<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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Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2023														
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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	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	0/0	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	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	0/1	0/0	0/0	0/1	0%
MALI	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/0	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	0/0	1/1	100%
TOTAL	0/0	0/0	0/0	0/0	2/2	1/1	1/3	1/3	1/3	1/2	0/0	0/0	7/14	50%
% CONTAINED	N/A	N/A	N/A	N/A	100%	100%	33%	33%	33%	50%	N/A	N/A	50%	
	Cells shaded in black denote months when zero indigenous cases were reported. Numbers indicate how many cases were contained and reported that month.													
	Numbers indicate how many cases were contained and reported that month.													

## UPCOMING MEETINGS

May 30, 2024: World Health Assembly Guinea Worm Ministerial Side Meeting

## RECENT PUBLICATIONS

Golden-Biddle K, 2024. Building capacity for Discovery (Chapter 6). In: “The Untapped Power of Discovery” New York: Routledge Taylor & Francis Group, pp.85-99.

### **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 and Adam Weiss of The Carter Center, Dr. Sharon Roy of CDC, and Dr. Dieudonné Sankara of WHO. Formatted by Mindze Nkanga. Translation support by Valerie Mendes.

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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_english.html).

[http://www.cartercenter.org/news/publications/health/guinea\\_worm\\_wrapup\\_francais.html](http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_francais.html)

[http://www.cartercenter.org/news/publications/health/guinea\\_worm\\_wrapup\\_portuguese.html](http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_portuguese.html)



CDC is the WHO Collaborating Center for Dracunculiasis Eradication