



Date: April 28, 2025

From: Guinea Worm Eradication Program, The Carter Center

Subject: GUINEA WORM WRAP-UP #319

To: Addressees

CHAD HOSTS 28TH INTERNATIONAL GWEP REVIEW MEETING

THE
CARTER CENTER



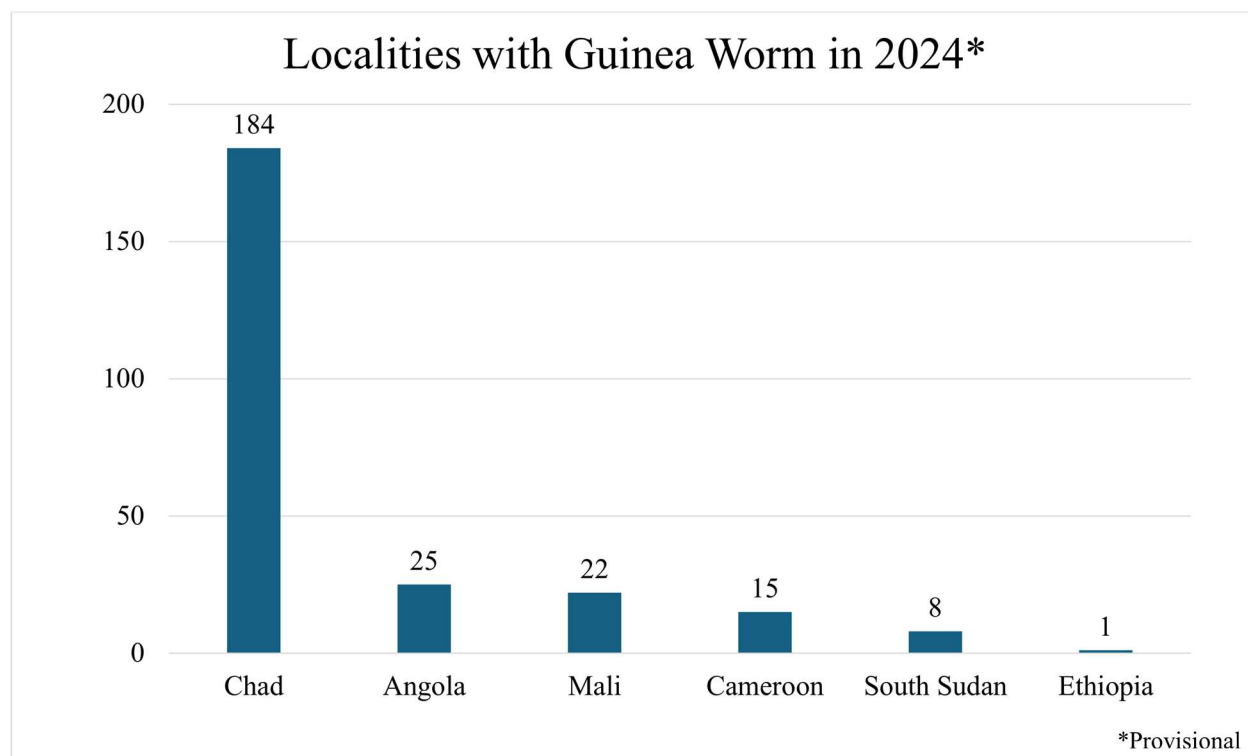
**World Health
Organization**

National Guinea Worm Eradication Program Managers, their associates, supporters, donors, and other Guinea Worm Warriors held the 28th Annual International Review Meeting of GWEP Program Managers at N'Djamena, Chad on April 8-9, 2025. The Prime Minister of Chad, His Excellency Allah-Maye Halina, opened the meeting, which discussed reports by leaders of the national programs, who are named in the summaries of their reports. Other participants included Chad's Minister of Health Dr. Abdelmajid Abderahim and the Minister of Health of Cameroon Dr. Malachie Manaouda; Deputy Secretary General Dr. Mahamat Hamit Ahmat and Director General Dr. Yam-Madji A. Djitangar of Chad's ministry of health, as well as Secretary General Dr. Evariste Djangbeye Guelngar of Chad's ministry of foreign affairs; Carter Center Chief Executive Officer Paige Alexander, Carter Center Board of Trustees member Dr. Rochelle Walensky, GWEP Director Adam Weiss, MPH, Sr. Country Representative Dr. Abdalla Mefteh, and Sr. Associate Director Sarah Yerian, MPH; WHO Country Representative Dr. Blanche P. Anya, Eradication/Elimination Team Lead Dr. Dieudonné Sankara, and Technical Officer Ms. Farah J. Agua; and Ms. Issetta B. Kabore-Ilboudo, Emergency WASH Specialist of UNICEF. The Minister of Health of Chad, Dr. Abdelmajid, closed the meeting.

The GWEPs reported 15 human Guinea worm cases and 664 animals with GW infections in 251 communities in 2024. This is a 7% reduction in animal infections and a 7% increase in human cases compared to the 714 infected animals and 14 human cases reported in 2023. In **Chad** and **South Sudan**, which were the only countries with human cases in 2024 (vs. five countries in 2023), GW was mainly sustained by infections in domestic dogs and by newly discovered transmission among small wild felines, respectively. **Mali** has limited residual transmission driven by infected dogs, but elimination is impeded by insecurity, while **Ethiopia** reduced its only known GW infections to baboons, in its smallest known affected area ever. **Cameroon's** increased GW infections in 15 villages of a single district now face intensified interventions, as **Angola** mobilizes against its small focus of infected dogs. The five countries, except Chad,

each have fewer than two dozen villages with GW infections (Figure 1). Details of the programs are summarized in this issue.

Figure 1



Insecurity has delayed certification of GW elimination in **Sudan**, which has not reported a GW case since 2002, and has never detected GW in an animal.

During January-March 2025, Chad reported 1 GW case (vs. none in January-March 2024), while Angola reported 19 animal GW infections (vs. 29 in January-March 2024), Cameroon reported 147 animal GW infections (vs. 131 in January-March 2024), and Chad reported 14 animal GW infections (vs. 44) (Table 1).

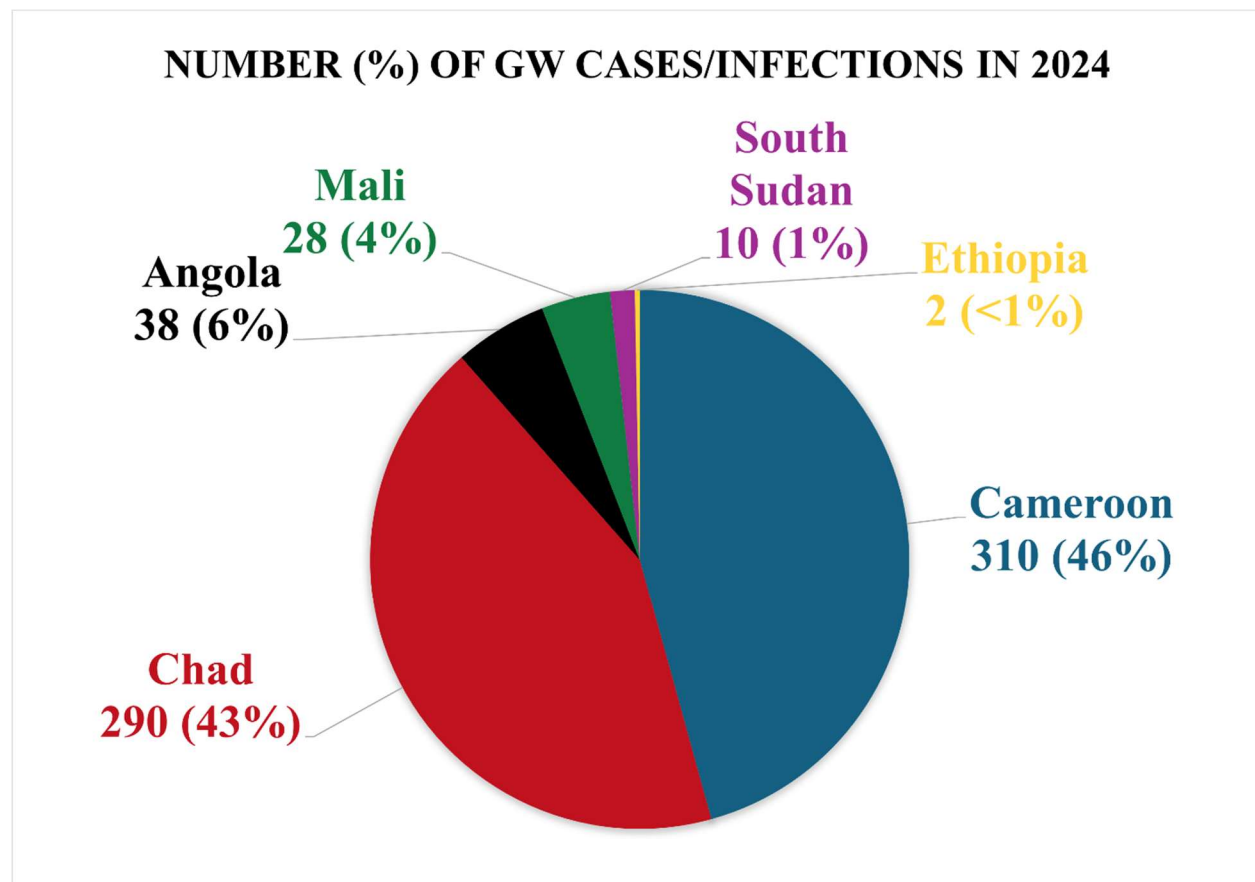
CAMEROON HAS THE MOST GUINEA WORM



Cameroon's national Guinea Worm Eradication Program, which began in 1987, was followed by ten years with no indigenous cases. Cameroon was certified Guinea worm-free by the World Health Organization in 2007, but began detecting GW again in 2019. The recent human cases and animal infections are in Cameroon's Guere district, which borders Chad's endemic Bongor district. Genetic analysis of GWs from both sides of the international border showed that the initial new infections were probably imported into Cameroon from Chad, since extended families live, work, and visit on both sides of the border. However, Guinea worm is now being transmitted in both Guere and Bongor districts, which are a single epidemiologic unit. With Chad's rapidly declining GW infections, Cameroon poses a threat to Chad's success as well as, potentially, Nigeria.

Dr. Georges B. Nko'Ayissi, Deputy Director of the Neglected Tropical Diseases Program, presented Cameroon's report to the International Review Meeting. In 2024, Cameroon reported 299 dogs and 11 cats with confirmed Guinea worm infections (total of 546 Guinea worms), which was more Guinea worm infections than any other country (Figure 2). Cameroon's 2024 total share reflects rising infections in Cameroon, which reported 275 confirmed animal infections in 2023, and previous leader Chad's increasingly successful Guinea Worm Eradication Program. Seventy-five percent (232/310) of Cameroon's animal infections were contained. Cameroon had no known human GW case in 2024.

Figure 2



Cameroon has advantages since its infections in 2024 were apparently confined to only 15 villages in one health district (Guere); Cameroon's typical GW transmission season is relatively short (January-July); and GW infection in Cameroon mainly occurs during the dry season, when travel to the affected area is easiest. In 2024, 76% of infections occurred in February-May. Cameroon is seeking to exploit those advantages. It has 27 villages under active surveillance in surveillance level 1, Guere (25), and surveillance level 2, Yagoua (2) health districts. The program recorded 2,782 rumored animal infections (91% investigated within 24 hours) and 1,135 rumored human cases (92% investigated within 24 hours) in 2024. The cash reward for reporting a human GW case is 100,000 CFA (~US\$162) and for reporting an animal infection is 10,000 CFA. A survey of 87 people in Level 1 villages found that 85% knew of the reward. In January-August 2024, Cameroon applied Abate in ten villages that reported 96% (297/310) of animal GW infections, it proactively tethered 83% of eligible dogs in ten endemic villages, and promoted the burial of fish guts in eight endemic villages that reported 89% of animal infections.

Chad GWEP Surveillance Snapshot 2024

*See definition on page 11

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Mali GWEP Surveillance Snapshot 2024

Accessibility: 89%

Villages reporting 1+ GW infection: 22

Number of districts by surveillance level: 6 in level 1; 2 in level 2; 67 in level 3

Villages under Active Surveillance (VAS): 1,965 (1,555 level 1; 1,410 level 2)

Monthly reporting rate for VAS: 88%

Number of rumors: humans 241; animals 1,150

Cash reward awareness: 89% humans, 86% animals

Integrated surveys: 20,940 (immunization campaigns)

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 20,940 (88%)

% presumed sources of human cases identified*: nothing to note.

% human and animal Guinea worm infections contained: 50%

*See definition on page 11

ETHIOPIA



National Program Coordinator Mr. Kassahun Demissie reported on the Ethiopian Dracunculiasis Eradication Program (EDEP). Ethiopia detected 2 baboons with 2 and 5 emerged Guinea worms in July and November 2024, respectively, at Akweramero Farm in Gog district of Gambella Region. It also reported a baboon with 6 confirmed *un-emerged* GWs at Eyerus Farm in Abobo district of Gambella Region in March, for a total of 13 known GWs in the two localities. The EDEP found no human, dog, or cat with GW infection in 2024. Genetic analysis suggests individual baboons can be exposed to large numbers of larval GW cohorts, but to date has found no direct linkage between GWs in different host species in Ethiopia.

An average 99.9% of 1,509 eligible dogs and cats were proactively tethered during the year. All eligible water sources in at-risk areas were treated with Abate. The amount of the cash reward for reporting a confirmed human infection or domestic animal infection is 10,000 Ethiopian birr (~USD\$81); the amount for reporting a confirmed GW infection in a wild animal is 2,000 Ethiopian birr (~USD\$16).

The EDEP's main challenges include inadequate safe drinking water in high-risk villages and commercial farms, inadequate surveillance of wild animals, and transnational movements of Felata communities. The status of Ethiopia's GW interventions and surveillance is summarized in Figure 3 and in the Surveillance Snapshot below.

Ethiopia EDEP Surveillance Snapshot 2024

Accessibility: 100%

Villages reporting 1+ GW infection: 1

Number of districts by surveillance level: 2 in level 1; 15 in level 2; 1,249 in level 3

Villages under Active Surveillance (VAS): 1,142 (198 level 1; 944 level 2; Non-Village Areas under Active Surveillance (NVAs): 276 (190 level 1; 86 level 2)

Monthly reporting rate for VAS: 100%

Number of rumors: humans 27,236 (99% investigated in 24 h), 3,426 domestic animals (100% investigated in 24h), 633 wild animals (100% investigated in 24h)

Cash reward awareness: 99% human, 98% animal (level 1 areas); 88% human, 83% animal (level 2)

Integrated surveys: 612,247 people (mass drug administration; polio, HPV, ITN distribution)

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 21,809 (84%)

% presumed sources of human cases identified*: nothing to note

% human and animal Guinea worm infections contained: 0%

*See definition on page 11

SOUTH SUDAN



Dr. Hakim Gol, Director of South Sudan's Guinea Worm Eradication Program (SSGWEP), presented his country's report. South Sudan detected 6 humans, 2 domestic cats, 1 domestic dog, and 1 wild genet with confirmed GW infections in 8 villages in 2024 (a line list of the human cases is in *Guinea Worm Wrap-Up* #316). These human GW cases and animal infections had a total of 13 emerged GWs. The SSGWEP also detected confirmed *un-emerged* GWs in 14 small wild felines (serval, wild cat, civet, genet) in 13 villages. These emerged and un-emerged GW cases and infections were detected in 7 counties (*GW Wrap-Up* #316). All 6 human cases and 2 of the animal infections with emerging GWs (a domestic cat and a genet) were uncontained. However, 2 of the infections were contained (a domestic cat and a dog). Eighty-eight (88) of the 294 specimens from animals and 27 human specimens that the SSGWEP submitted to CDC for laboratory testing were *Spargana*. Genetic analysis finds that most contemporary GW infections in South Sudan, including GWs from wild animals, are not linked to other detected GW infections.

The status of the SSGWEP's interventions and GW surveillance in 2024 is summarized in Figure 3 and in the Surveillance Snapshot below. South Sudan's National Committee for the Certification of Dracunculiasis Elimination (NCCDE) met twice in 2024, in April and June. South Sudan's cash reward for reporting a contained case or infection is 200,000 South Sudanese pounds (~US\$1,535); 100,000 SSP for an uncontained case or infection, and 50,000 SSP for tethering and managing an infected animal.

South Sudan GWEP Surveillance Snapshot 2024

Accessibility: 99% (2 payams in Tonj East County were not accessible in Sept & Oct due to conflict.)

Villages reporting 1+ GW infection: 8

Number of counties by surveillance level: 6 in level 1; 21 in level 2; 45 in level 3

Villages under Active Surveillance (VAS): 2,490 (709 level 1; 871 level 2) [910 level 3]

Monthly reporting rate for VAS: 96%

Number of rumors: human 445,960 (99% investigated in 24h), 34,706 animal (99% investigated in 24h)

Cash reward awareness: 47% level 3

Integrated surveys: Not done.

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

% presumed sources of human cases identified*: 50%

% human and animal Guinea worm infections contained: 20%

*See definition on page 11

ANGOLA



Dr. Maria Cecilia C. de Almeida, National Program Coordinator of Angola's Neglected Tropical Diseases Program, reported on Angola's efforts to eliminate Guinea worm disease. Angola detected 39 dogs infected with 41 Guinea worms in 25 villages in 2024: 24 dogs in Namacunde municipio and 15 dogs in Cuanahama municipio of Cunene Province. Most of the infections (36) occurred in January-April, with 3 in October. This is a 55% reduction from the 87 dog infections Angola reported in 2023. However, genetic analysis of GWs from Angola suggests this is an inbred population of GWs and that many infections have been missed. In 2023, the reward for reporting a Guinea worm case in a human or an infection in an animal was 75,000 kwanza (~US\$83). A new, lower reward amount starting in 2024 has been proposed. Angola investigated 48 (73%) of 66 rumors of GW in humans within 24 hours in 2024 and 83% of 54 rumors in animals. The program distributed 38,528 cloth filters to 6,389 families, applied Abate in 26 to 56 localities

during June-November, and began sensitizing people in endemic communities to cooperate in proactively tethering their dogs.

SUDAN



Sudan's report was presented by Elrofaay Mohammed. Sudan has not detected an indigenous case of Guinea worm disease since 2002, and it has never detected an animal infected with GW. Preparations for certifying Guinea worm elimination have been delayed by the civil conflict that began in Sudan in April 2023. Sudan has 26 formerly endemic districts and 163 never endemic districts. Many of Sudan's states are inaccessible due to the civil war. Due to intense population movement at the border with South Sudan, including Kafia Kinji village that reported the last known cases in 2013, community volunteers maintained active surveillance and monthly reporting. The program investigated all 193 rumors of human infections it received in 2024 within 24 hours. It also conducted an active case search that reached 11,519 households and screened 190 dogs and 22 cats in Blue Nile State. One specimen sent to the laboratory at CDC was not GW.

CENTRAL AFRICAN REPUBLIC



Dr. Georges Hermana, Director of the National Program for Control of Neglected Tropical Diseases, presented Central African Republic (CAR)'s brief report. The World Health Organization (WHO) certified CAR as Guinea worm-free in 2006. CAR is at risk of imported GW infections because seven of its health districts border Chad. CAR detected a confirmed Guinea worm case in Gordil village of Vakaga health district in 2022, and another confirmed case in Takadja village of the same sanitary district in 2023. These two villages are located 113 kilometers (~68 miles) and 85 kilometers (~51 miles) from the Chadian border, respectively. CAR detected no confirmed GW case or infection in 2024. WHO has assisted CAR's surveillance, investigation, and control measures, and The Carter Center helped train district health agents for GW surveillance and elimination in July 2024. CAR also seeks to synchronize its surveillance and control measures with Chad's GWEP.

GUINEA WORM RESEARCH MEETING

During April 1—3, 2025, the Guinea Worm Eradication Program (GWEP) hosted a two-and-a-half-day Research Review Meeting at The Carter Center (TCC) in Atlanta to bring together research staff, partners, and advisors who support the GWEP's research agenda. A total of 65 participants joined the meeting in person, and additional participants joined virtually. Dr. Kashaf Ijaz, Vice President of Health Programs at TCC, opened the meeting with remarks, and Mr. Adam Weiss, Director of the GWEP, provided an update on the status of the program and progress made during 2024. Dr. Maryann Delea, GWEP's Senior Associate Director of Research, and Dr. Jessica van Loben Sels, GWEP's Associate Director of Research, provided overviews of the GWEP's research agenda and strategic approach to Guinea worm diagnostics research and development, respectively. The opening program was followed by 24 presentations from various research partners representing all five of the GWEP's research work streams and the cross-cutting modeling initiative. Presenters shared emerging results from their respective studies and discussed their thoughts regarding implications for Guinea worm disease eradication efforts.

Over the course of the meeting, diagnostics presentations highlighted how sequencing, immunoassays, and nucleic acid amplification tests are redefining what is possible for the detection of recent or active GW infection and environmental surveillance. Several talks highlighted that addressing animal infections is key to the goal of disease eradication. Expansion of active baboon surveillance, including trapping and tracking activities, and innovations in data use, such as near-real-time (i.e., weekly) analyses of GPS collar data from baboons, are informing investigations and programmatic activities to address potential transmission among wild animal hosts in Ethiopia. Emerging results from water ecology studies are shedding light on copepod population dynamics and behavior, which could help inform sampling strategies for environmental surveillance and other programmatic interventions. Modeling initiatives are providing insights into timelines for eradication and the potential effects of novel diagnostic tools. Recommendations from the meeting suggested that additional integration, collaboration, and cross-fertilization across GWEP research work streams are needed and desired by the research community.

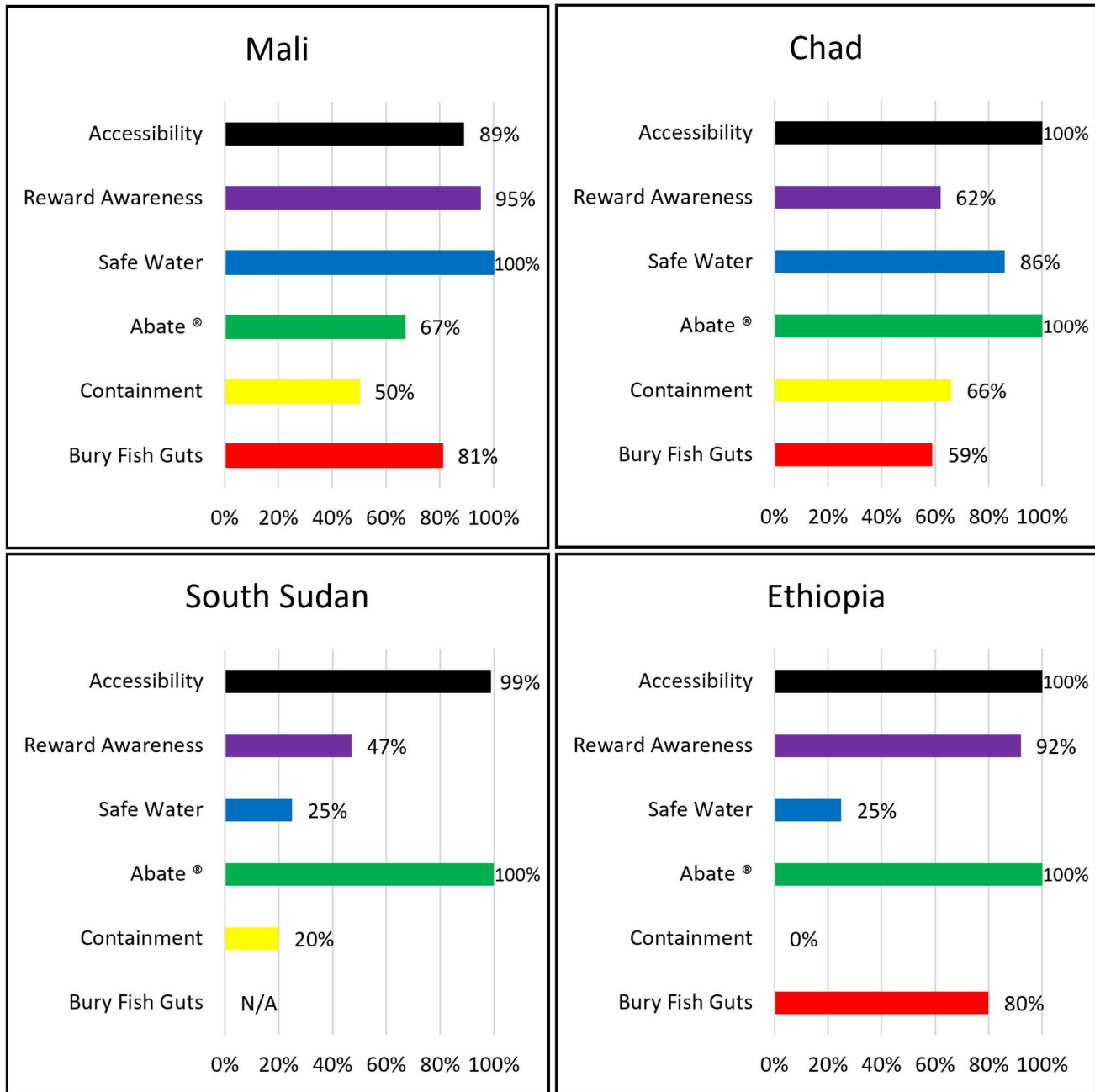
MEETINGS

The annual Ministerial Meeting on Guinea Worm Eradication will be held in Geneva during the World Health Assembly on May 21, 2025.

N.B.: Details of Chad's 9th case of GW disease in 2024

This patient is a 14-year-old mentally unstable boy, resident of Kousseri village of Kyabe health district, whose GW emerged on 28 December 2024. His infection was not contained. His village has sources of safe drinking water, but the patient drinks unfiltered water from a nearby river and eats raw fish. The source of this case may be indigenous. Another patient in the same village had a worm emerge on August 15, 2023. Kousseri had three dogs with GW infections in 2024 but no known animal GW infections in 2023 or 2022. The mode of infection is likely the consumption of raw fish. Kousseri village has 2,601 inhabitants, 364 dogs, and 405 cats. See Table 1 in *Guinea Worm Wrap-Up* #316 (January 2025) for a list of the other GW cases in 2024.

Figure 3: Guinea Worm Eradication Program Indices Coverage for 2024



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 other human case(s) or an infected animal 10-14 months before infection, or

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

The patient drank unsafe water from a (specify) 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 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 the source(s) 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 also be applied, as appropriate, to define containment for an animal with Guinea worm infection*

Table 1 Number of Laboratory-Confirmed Human Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2025* (Countries arranged in descending order of cases in 2024)														
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 / 1	0 / 0	0 / 0										0 / 1	0%
SOUTH SUDAN	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 / 1	0%
% CONTAINED	0%	N / A	N / A										0%	
*Provisional														
	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	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 3	1 / 1	1 / 1	1 / 1	1 / 1	0 / 1	4 / 9	44%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 2	0 / 3	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 6	0%
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	0 / 0	N / A
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
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
TOTAL*	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 2	0 / 6	1 / 1	1 / 2	1 / 1	1 / 1	0 / 1	4 / 15	27%
% CONTAINED	N / A	N / A	N / A	N / A	0%	0%	0%	100%	50%	100%	100%	N/A	27%	
	Cells shaded in black denote months when zero indigenous cases were reported. Numbers indicate how many cases were contained and reported that month.4													
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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 Adam Weiss at The Carter Center (adam.weiss@cartercenter.org).

Note to contributors: Submit your contributions via email 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. Maryann Delea of The Carter Center, and Dr. Dieudonné Sankara of WHO. Formatted by Amanda Larson and Diana Yu.

Back issues are also available on the Carter Center website in English, French, and Portuguese and are located at:

http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_english.html.

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