



Date: March 22, 2023
From: WHO Collaborating Center for Dracunculiasis Eradication, CDC
Subject: GUINEA WORM WRAP-UP # 296
To: Addressees

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26TH INTERNATIONAL REVIEW MEETS VIRTUALLY



According to final reports presented at the 26th Annual Review Meeting of Guinea Worm Eradication Program Managers and summarized in this issue, in 2022 the global Guinea Worm Eradication Program **reduced human cases by 13%** to their lowest level ever, 13 cases, and **reduced animal infections by 21%** compared to 2021 (Table 1). **No human Guinea worm case was reported worldwide for six months of 2022 (!)**, and the World Health Organization **certified Democratic Republic of the Congo as Guinea worm-free**. Figure 3 illustrates the status of key intervention indices for Chad, Ethiopia, Mali, and South Sudan in 2022.

	<u>Humans</u>	<u>Animals</u>	<u>Worms</u>	<u>1+ Villages 2022</u>
Chad	6	606	1,102	270
Mali	0	41	61	21
Cameroon	0	28*	43	11
Angola	0	7	10	2
South Sudan	5	1	11	4
Ethiopia	1	3	11	3
Central African Rep.	1*	0	1	1
TOTAL	13	686	1,239	312

*Apparently imported from Chad

Organized by The Carter Center in cooperation with the World Health Organization (WHO) and attended by about one hundred persons, the International Review Meeting convened virtually on March 1-3, 2023. Carter Center CEO Mrs. Paige Alexander, Carter Center Board of Trustees Chairman Mr. Jason Carter, and World Health Organization (WHO) Director-General Dr. Tedros Ghebreyesus gave welcoming addresses in the opening session, which was chaired by Mr. Adam Weiss, Director of the Guinea Worm Eradication Program at The Carter Center. The Honorable Minister of Health of Ethiopia, Dr. Lia Tadesse, also greeted participants at the beginning of the meeting and expressed readiness to redouble the ministry's commitment to "Mission Zero" of the Abu Dhabi Declaration in March 2022, before WHO Director of the Department of Control of Neglected Tropical Diseases, Dr. Ibrahima Soce Fall gave an overview of his vision and the NTD Roadmap. On the last day of the meeting, Inspector-General Dr. Ismael Bahar of Chad's Ministry of Health read a statement on behalf of his minister in which the honorable minister acknowledged the challenges remaining in the program and thanked the partners, especially Former President Jimmy Carter, for their support. Drs. Donald Hopkins (TCC), Dieudonné Sankara (WHO), Daniel Argaw Dagne (WHO) and Dr. Kashef Ijaz also chaired sessions of the meeting. The meeting's third day featured presentations on research, including modeling the risks of Guinea worm transmission, geospatial technologies for detecting water bodies, studies of baboons and copepods, genomics, diagnostic tools, and trial of a potential treatment for infected dogs. It was chaired by veterinarian Dr. Fernando Torres-Velez, Associate Director for Research in the GWEP at The Carter Center, who oversees the wide-ranging research agenda in support of Guinea worm eradication, and by Drs. Maryann Delea and Obiora Eneanya.

Where exposed (link to year before)? How exposed (transmission mode)?

CHAD: STATE SECRETARY OF HEALTH OPENS NATIONAL PROGRAM REVIEW

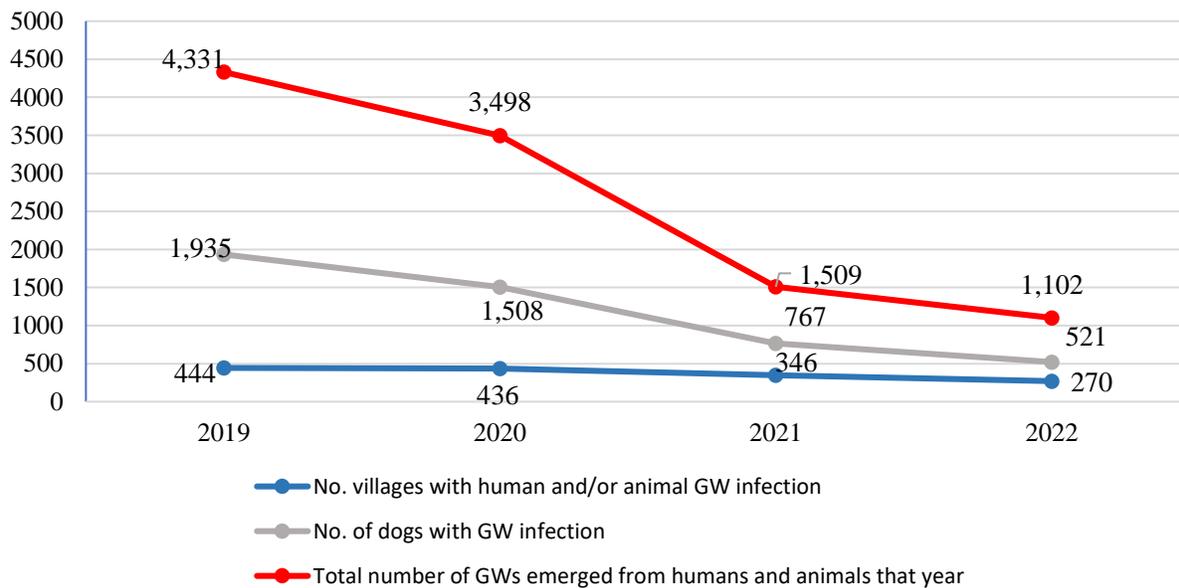


Chad's Guinea Worm Eradication Program (CGWEP) convened its 10th Annual Review Meeting in N'Djamena on February 2-3, 2023. State Secretary of Health Zenab Bechir Moussa addressed the Opening Ceremony, in addition to Mayor of N'Djamena Bartchiret Fatime Zara Hanana Douga, World Health Organization Representative Dr. Thiero Mamaoudou, and Carter Center GWEP Director Adam Weiss. The government stressed its ownership of the CGWEP and the need for government officials at all levels to intensify their engagement at the community level. After the opening session the National Program Coordinator, Dr. Tchindebet Ouakou, provided an extensive overview of the national program, including some research activities currently underway. Dr Dieudonné Sankara from WHO, HQ Geneva attended the meeting along with Health delegates from each endemic province of Chad, ministry of health staff, Carter Center technical advisors, WHO Chad country office and IRED (animal research institute) staff.

Chad reduced the number of villages with human and/or animal Guinea worm infections (-22%), the number of infected dogs (-32%), and the total number of Guinea worms emerged from humans and animals (-27%) in 2022, compared to 2021.

Figure 1

**Chad Guinea Worm Eradication Program;
Numbers of villages and dogs with GW infections, and
total number of GWs emerged from humans and
animals in 2019, 2020, 2021, 2022**



Chad reported 6 human Guinea worm cases (33% contained) for a 25% reduction in cases, 521 infected dogs (70% contained), and 85 cats (65% contained), in 2022. Presumed sources of 6 of the human cases were indigenous (same village). Chad increased the number of villages enrolled in proactive tethering by 13% in 2022, from 276 to 313 (Chad tethered 26,853 dogs and cats in 2022) and increased the number of water source treatments with Abate by 30%, from 6,204 to 8,047. It aims to expand the 78% of eligible villages covered by proactive tethering in 2022 to 100% of eligible villages in 2023. *Chad's international border areas of Bongor district in Mayo Kebbi Est Province facing Cameroon (see below) and Haraze district of Salamat Province facing Central African Republic (see previous issue) require special attention to prevent exported infections.* The summary of key intervention indices for the CGWEP in 2022 is in Figure 3; the CGWEP Surveillance Snapshot 2022 is below.

The National Program Coordinator of the CGWEP, Dr. Tchindebet Ouakou, Carter Center Acting Country Representative in Chad Sadi Moussa, Carter Center GWEP Director Adam Weiss, and Carter Center Associate GWEP Director Karmen Unterwegner met with the Honorable Minister of Health, Dr. Abdelmadjid Aberahim, on February 6 to discuss the status of the CGWEP and strategies to help accelerate Guinea worm elimination.

Chad GWEP Surveillance Snapshot 2022

Accessibility: 99+%

Villages reporting 1+ GW infection: 344

Number of districts by surveillance level: 30 in level 1; 3 in level 2; 93 in level 3

Villages under Active Surveillance (VAS): 2,434 (2,371 level 1; 63 level 2)

Monthly reporting rate for VAS: 98%

Number of rumors: humans 129,996 (98% investigated in 24h), animals 117,574 (98% investigated in 24h)

Cash reward awareness: 72% humans, 72% animals

Integrated surveys: None

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 2,353 (98%)

% presumed sources of human cases identified*: 17% (1/6)

% human and animal Guinea worm infections contained: 68% (417/612)

*see definition on page #12

MALI: MINISTER OF HEALTH ATTENDS PROGRAM REVIEW CLOSING CEREMONY



Mali's Guinea Worm Eradication Program (MGWEP) convened its annual review meeting in Bamako on February 9-10, 2023. National Program Coordinator Dr. Cheick Coulibaly summarized the work of the program in 2022. The program included detailed summaries of MGWEP activities in the two remaining regions with endemic villages, Mopti and Segou, and discussed the strategy of proactive tethering of dogs and cats in parts of Macina district/Segou Region and Djenne district/Mopti Region. Mali tethered 434 dogs proactively in 2022 after pilot testing the intervention late in 2021. Mali reported no Guinea worm cases in humans and confirmed Guinea worm infections in 41 animals (39 dogs, 2 cats; 63% contained) in 2022. The coordinator of the Peace through Health initiative, Boukary Sangare presented an update on results and methods of the initiative and received very positive feedback from ministry of health officials and institutional partners. The Honorable Minister of Health, Mme. Diemnatou Sandare, attended the final session of the review and closed the meeting. Participants at the review included representatives of partner organizations The Carter Center (Mr. Adam Weiss), the World Health Organization (Drs. Dieudonné Sankara and Andrew Seidu Korkor), and UNICEF Mr. Alain Dembele. The summary of key intervention indices for the MGWEP in 2022 is in Figure 3; the MGWEP Surveillance Snapshot 2022 is below.

Mali GWEP Surveillance Snapshot 2022

Accessibility: 96%

Villages reporting 1+ GW infection: 21

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

Villages under Active Surveillance (VAS): 2,216 (1130 level 1; 1086 level 2)

Monthly reporting rate for VAS: 97%

Number of rumors: humans 461 (99% investigated in 24h), 426 animals (99% investigated in 24h)

Cash reward awareness: 84% humans, 81% animals

Integrated surveys: None.

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 1,442 (79%)

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

% human and animal Guinea worm infections contained: 63% (26/41)

*see definition on page 12

ETHIOPIA

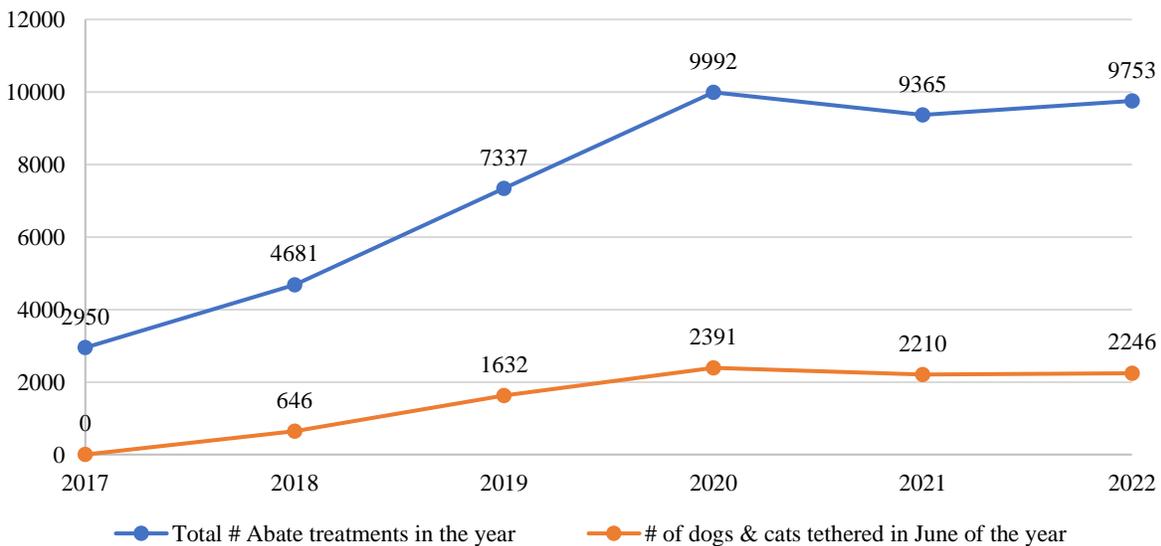


Ethiopia's Dracunculiasis Eradication Program (EDEP) National Program Coordinator Mr. Kassahun Demissie presented Ethiopia's report to the virtual International Program Review Meeting. He noted Ethiopia's final statistics of 4 confirmed Guinea worm infections (2 contained) with a total of 11 worms reported in 2022: 2 baboons, 1 dog, and 1 human. The EDEP and Ethiopian wildlife authorities are discussing a protocol that will govern how they manage

live baboons that are discovered to have Guinea worm infection when they are trapped for study. As reported in the previous issue, since 2018 the EDEP has expanded Abate treatments and proactive tethering of dogs and cats aggressively in the limited remaining area of transmission in Gog district of Gambella Region.

Figure 2

Ethiopia Dracunculiasis Eradication Program Expansion of Abate Treatments and Proactive Tethering



Ethiopia tethered 1,607 dogs and 216 cats in 2022. The summary of key intervention indices for the EDEP in 2022 is in Figure 3; the EDEP Surveillance Snapshot 2022 is below.

Ethiopia GWEP Surveillance Snapshot 2022

Accessibility: 100%

Villages reporting 1+ GW infection: 3

Number of districts by surveillance level: 2 in level 1; 14 in level 2; 1,107 in level 3

Villages under Active Surveillance (VAS): 1,142 (198 level 1; 944 level 2); Non-Village Areas under Active Surveillance (NVAs): 321 (213 level 1; 108 level 2)

Monthly reporting rate for VAS: 100%

Number of rumors: humans 30,440 (99% investigated in 24h), 7,548 animals (100% investigated in 24h)

Cash reward awareness: 97% humans, 95% animals

Integrated surveys: 125,914 persons were interviewed during Mass Drug Administrations

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

% presumed sources of human cases identified*: 100%

% human and animal Guinea worm infections contained: 50% (2/4)

*see definition on page 12

SOUTH SUDAN



The South Sudan Guinea Worm Eradication Program (SSGWEP) Director Mr. Makoy Samuel Yibi presented South Sudan's report to the International Program Review Meeting. He noted South Sudan's final statistics of 6 confirmed Guinea worm infections (4 contained) in 1 dog and 5 humans, with a total of 11 worms reported in 2022. Four of the human cases with worm emergences between August 31 and October 2 were linked to Jarweng village in Awerial district of Lakes State, including three persons in one family (a mother and two young sons), who were likely exposed to a common source of infection. *The salient question in the SSGWEP is whether the sparse Guinea worm infections in South Sudan in recent years are being sustained by missed cases in humans, by undiscovered Guinea worm infections in animals, or both. Based on epidemiologic investigations, the program appears to have prevented forward transmission from all known Guinea worm cases for at least the last five years.* Genetic analysis of emerged worms may help clarify this in 2023. Also unclear is the relative role of potential modes of transmission: via drinking water or via eating undercooked aquatic animals. Some young boys are known to eat fish which they've caught and roasted only partially. The occurrence of most cases in 1-14-year-old children and 25-29-year-old women in 2007-2022 suggests Guinea worm may be being transmitted near homes. The SSGWEP has found only two infected dogs ever, one in Angon village of Udici payam in Jur River County/Western Bahr Al-Ghazal State in September 2015 and the other in Wunlaac village of Mayen payam in Tonj East County/Warrap State in August 2022. Both dogs were in the "Warrap Focus" in northwest South Sudan, one of four previously endemic foci in the country, but the two infected dogs were detected 7 years and about 100 miles (~168 km) apart. The infected dog in 2015 was in a household with a Guinea worm patient.

In 2022, the SSGWEP and its WASH partners drilled 17 borehole wells, repaired 23 broken boreholes, and trained 214 persons in 40 communities as part of community water and sanitation committees in Uror, Awerial, Tonj East, and Rumbek North Counties. These communities were targeted by the SSGWEP/WASH because they reported cases that year or in the previous year, are a part of the endemic cluster villages, or are at high risk of Guinea worm. The summary of key intervention indices for the SSGWEP in 2022 is in Figure 3 bar graph; the SSGWEP Surveillance Snapshot 2022 is below.

Editorial note: *The unusual parallel occurrence in South Sudan of numerous Spargana infections—a parasitic worm whose life cycle resembles Guinea worm’s life cycle and includes infected copepods, dogs, cats, fish, amphibians, and other wild vertebrates—may suggest potentially similar transmission to humans by eating poorly-cooked paratenic hosts. According to a recent summary by Dr. Vitaliano Cama of CDC, 123 of the 133 specimens submitted to the CDC laboratory by national Guinea Worm Eradication Programs from 2012 to 2022 that were found to be Spargana came from South Sudan. The other ten Spargana specimens were from Ethiopia (4), Chad (3), Kenya (2), and Mali (1). This suggests the need to intensify health education about cooking practices and safe disposal of fish guts in all areas of South Sudan where Guinea worm or Spargana infections occur.*

South Sudan GWEP Surveillance Snapshot 2022

Accessibility: 100%

Villages reporting 1+ GW infection: 4

Number of counties by surveillance level: 4 in level 1; 10 in level 2; 66 in level 3

Villages under Active Surveillance (VAS): 2,237 (1,704 level 1; 533 level 2)

Monthly reporting rate for VAS and cattle camps: 92%

Number of rumors: 67,788 humans (99% investigated in 24h), 1,111 animals (99% investigated in 24h)

Cash reward awareness: 78% humans, 43% animals

Integrated surveys: 18,410 people screened in case sweeps

Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 4,537 (84%)

% presumed sources of human cases identified*: 0%

% human and animal Guinea worm infections contained: 67% (4/6)

*see definition on page 12

CAMEROON



The National Coordinator of Cameroon’s program on Neglected Tropical Diseases, Dr. Georges Nko’Ayissi, reported that Cameroon detected 28 dogs with Guinea worm infections in 2022, all of which were reportedly contained, and all of which were found in a cluster of villages in Guere health district of Extreme North Region. Cameroon reported its last indigenous human Guinea worm case in 1997 and was certified as Guinea worm-free in 2007. Since 2019, this area of Cameroon has reported a total of 43 infected dogs, 2 human cases, and 1 infected cat. The 20 mile (35 kilometer) long area of concern is on the bank of the Logone River, which forms the international border between Guere district in

Cameroon and Bongor district in Chad's Mayo Kebbi Est Region (see *Guinea Worm Wrap-Up* #285). The peak Guinea worm transmission season is January-April, the dry season, when the river is often shallow enough to wade across. The international border here is very porous, with multiple crossing paths, shared markets, and families and relatives of the same ethnic group living on both sides of the river. People and dogs cross frequently from one side to the other, such that the affected area of Guere district is functionally an epidemiological extension of the adjacent endemic area in Chad's Bongor district. Despite Chad's recent progress, Bongor was one of four Chadian districts that reported increased Guinea worm infections in 2022.

WHO has helped Cameroon's post-certification efforts to address the apparently imported infections since 2019 and provided a technical assistant, Mr. Yaya Goutang in December 2021. Chad's GWEP has also assisted with training, Abate, and participation in border meetings and joint supervisory missions with Cameroonian counterparts, supported by The Carter Center and WHO. The Carter Center assigned Ms. Claire Aubry to assist Guinea worm activities in November 2022. Goutang and Aubry are both based in Guere district. Cameroon began seasonal proactive tethering of dogs in December 2021 and expanded active surveillance for Guinea worm infections from 6 to 15 villages in January 2022 and is currently working to include an additional 8 high-risk villages. The program proactively tethered 13 (46%) of the 28 infected dogs reported in 2022 and has expanded proactive tethering to 10 villages in 2023. Water sources were treated with Abate in 57% of the 11 villages with infections in 2022. With recently intensified effort and improved surveillance, Cameroon has reported 20 dogs (95% contained) with probable Guinea worm infections in January 2023, pending laboratory confirmation, and 43 suspected infected dogs in February.

ANGOLA



Angola detected 3 human Guinea worm cases and 8 infected dogs in 2018-2022, all in Cunene Province, including 7 *uncontained* dogs reported in 2022, 6 of which were in Namacunde Municipality and 1 in Cuanahama Municipality. The dog infections were all reported by members of the two respective communities. With WHO support the Angola Guinea Worm Eradication Program is carrying out active surveillance in 61 villages: 39 in Namacunde, 11 in Cuanahama, and 11 in Cuvelai Municipality. The program received 88 rumors of Guinea worm infections in 2022 (68 human, 20 animal) and investigated 83% within 24 hours, compared to 31 rumors in 2021.

Angola's January-May transmission season for Guinea worm infections coincides with the rainy season, which impedes surveillance and interventions. So far flooding has prevented collection of a specimen from a suspected Guinea worm infection in a dog in February 2023. From January to mid-March 2023, a total of 27 rumors (3 humans and 24 in animals/dogs) have been notified by the communities. Investigations have been completed, resulting in 16 provisional animal infections, of which the collected samples are in the process of being sent to CDC Atlanta for confirmation. The process is being delayed due to flooding in Cunene.

Angola received a shipment of Abate in November 2022, has trained health staff to use it, and plans to start using Abate as soon as the flooding recedes, likely in April-May 2023. The program began tying up some dogs with ropes in 2023 and is exploring how best to implement proactive tethering.

JOSEPH GIORDANO: EARLY GUINEA WORM WARRIOR

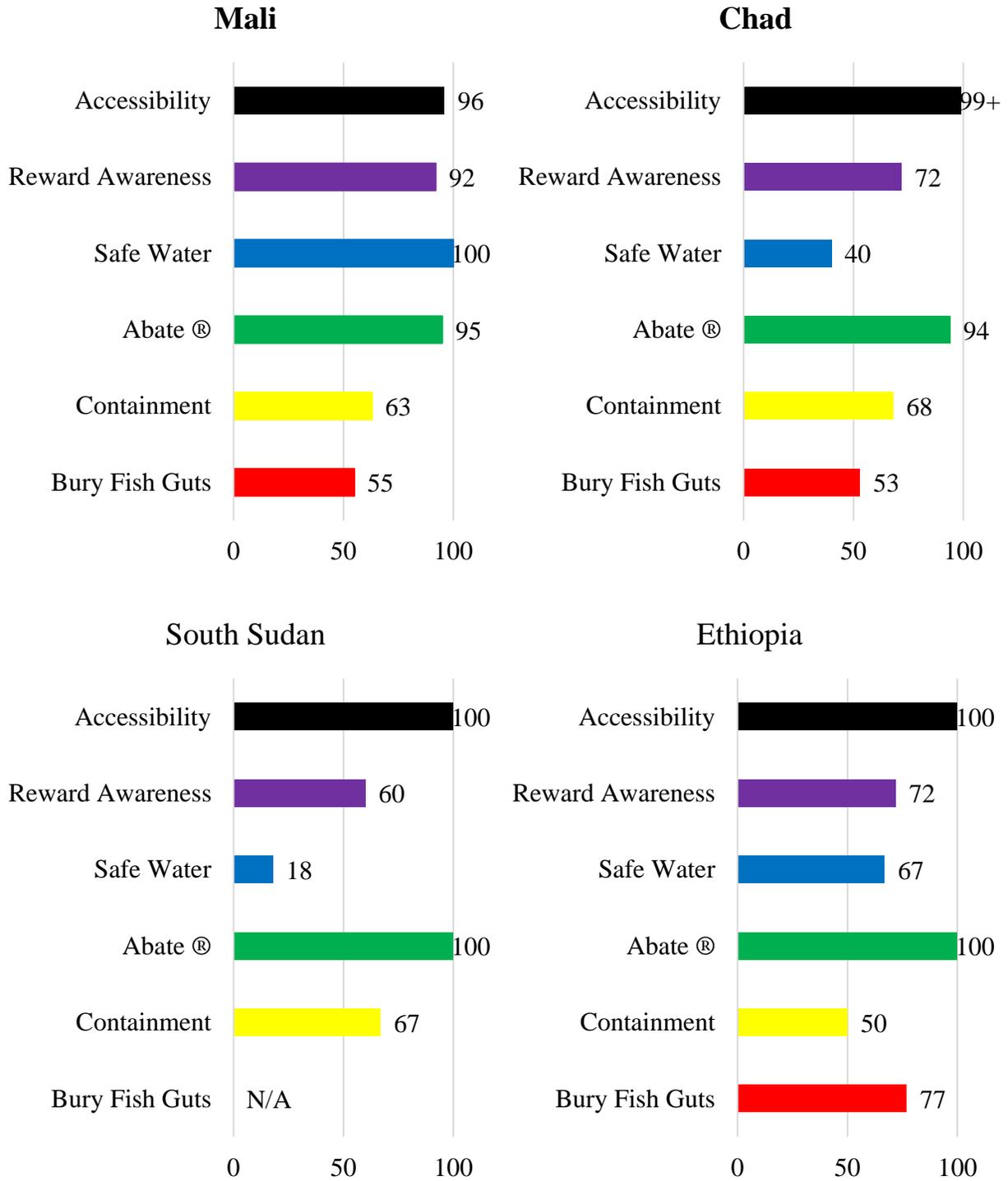
We deeply regret to report the passing of Joseph Giordano (1926-2023). He was the first director of operations for the Global 2000 unit of The Carter Center, which included the Center's young Guinea Worm Eradication activity, as well as a robust Sasakawa-Global 2000 agriculture initiative. He came to The Carter Center in 1985 after over two decades of distinguished service at the U.S. Centers for Disease Control and Prevention, including as director of CDC's Foreign Quarantine Division. At The Carter Center, Joe was a warm, creative, and effective manager and administrator, helping President Carter, Center Executive Director Dr. Bill Foege, and consultant Dr. Don Hopkins to nurture and develop the Center's Guinea worm eradication activity during its fragile early stage. His skills were especially critical for the first Carter Center-assisted national Guinea Worm Eradication Programs in Pakistan, Ghana, and Nigeria. He retired from The Carter Center in 1990. We extend our deepest condolences to his family.

THANKS TO AMANDA LARSON

Amanda Larson has helped produce the *Guinea Worm Wrap-Up* from issue #280 (August 30, 2021) to issue #295 (January 30, 2023), by preparing Tables and Figures and formatting the layout. Through it all, she relished the opportunity to learn about the Guinea Worm Eradication Program and its challenges, becoming a valued Guinea Worm Warrior herself in the process. She leaves direct involvement in the battle against the Great Worm to accept a new position at The Carter Center. We are grateful for her dedication, diligence, and attention to detail. Best wishes, Amanda, and THANK YOU!!

Figure 3

Guinea Worm Eradication Program Indices Coverage for 2022*



*See criteria for indicator in text.

N/A = Not Applicable

MODIFIED INTERVENTION INDICES TO REFLECT VARIABLE MODES OF TRANSMISSION

With *D. medinensis* infections occurring in animals in three of the final four endemic countries (South Sudan is the exception) 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
Number of Laboratory-Confirmed 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												N/A
SOUTH SUDAN	0/0	0/0												N/A
ETHIOPIA	0/0	0/0												N/A
CENTRAL AFRICAN REPUBLIC	0/0	0/0												N/A
MALI	0/0	0/0												N/A
TOTAL*	0/0	0/0												N/A
% CONTAINED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**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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Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2022
 (Countries arranged in descending order of cases in 2021)

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	1/2	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	0/0	2/3	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 %
TOTAL	0/0	1/2	0/0	0/0	0/0	0/1	1/3	1/2	3/4	1/1	0/0	0/0	7/13	54 %
% CONTAINED	N/A	50 %	N/A	N/A	N/A	0 %	33 %	50 %	75 %	100 %	N/A	N/A	54 %	

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.

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. Dieudonné Sankara of WHO.

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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.

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**World Health
Organization**

CDC is the WHO Collaborating Center for Dracunculiasis Eradication