DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control

And Prevention (CDC)

Memorandum

Date: March 31, 2022

From: WHO Collaborating Center for Dracunculiasis Eradication, CDC

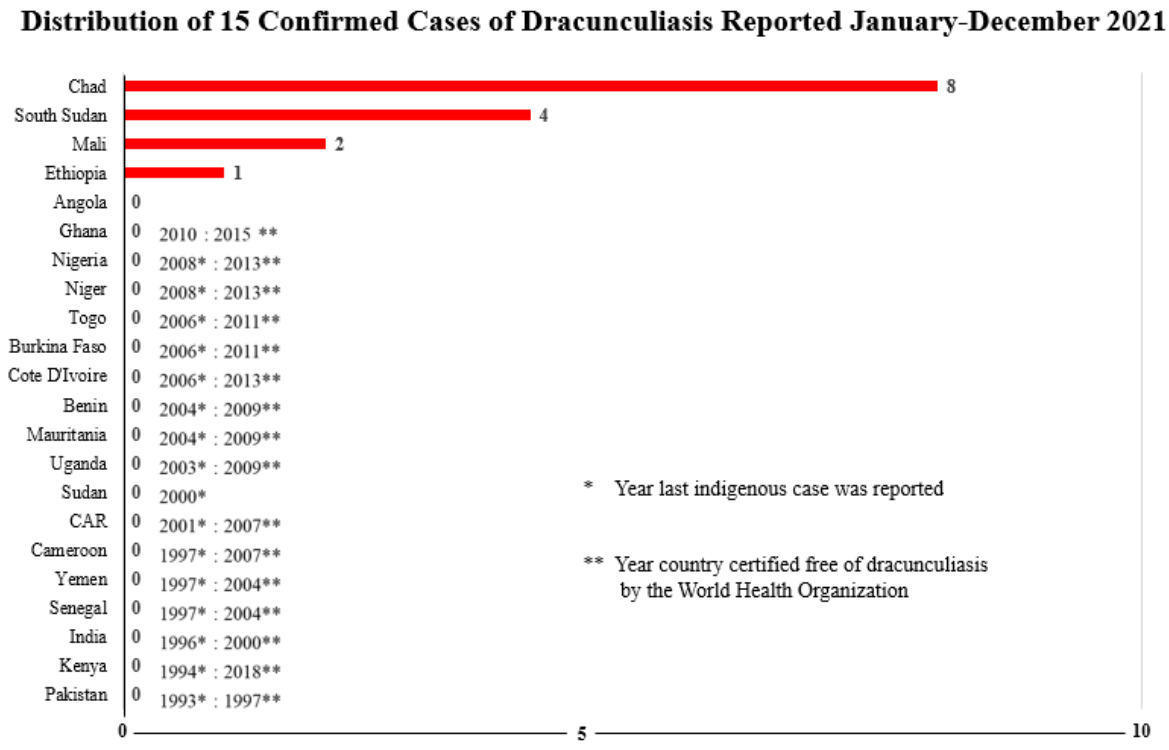
Subject: GUINEA WORM WRAP-UP #286

To: Addressees

"*Just 15"* (video):

https://video.cartercenter.org/Default.aspx?youtube_id=PQZjCteVvFA&category=Health&filter=Guinea%20Worm%C2%A0Eradication%20Program

Figure 1



HISTORIC ABU DHABI GUINEA WORM SUMMIT MARKS PROGRESS, PARTNERSHIP

Ministers and representatives from Angola, Cameroon, Chad, Ethiopia, South Sudan, Democratic Republic of the Congo, and Sudan joined other health experts and political leaders in a Guinea Worm Summit to celebrate progress, discuss the latest status of the Guinea worm eradication campaign, and renew commitment for the "last mile" of Guinea worm eradication. Held in Abu Dhabi, United Arab Emirates on March 20-22, the summit highlighted the more than thirty-year-old partnership between the United Arab Emirates and The Carter Center in support of the Guinea Worm Eradication Program. In opening remarks at the Summit, World Health Organization (WHO) Director General Dr. Tedros Ghebreyesus recalled the "immense suffering to entire families" caused by Guinea worm disease, praised the "incredible achievement" of the campaign to date, and noted that "this last mile is the most difficult." His Excellency Sheikh Shakhbout bin Nayan Al Nayan, Minister of State at the Ministry of Foreign Affairs and International Cooperation, United Arab Emirates, said that "Thanks to the commitment of The Carter Center and partners around the world, we have made incredible progress towards ending Guinea worm disease-but the work is not over. This week we were honored to convene global champions of the eradication effort in Abu Dhabi to renew our shared commitment towards reaching that last mile of disease eradication." Chair of The Carter Center Board of Trustees Mr. Jason Carter, grandson of the Center's founders, noted that his grandfather President Jimmy Carter "and His Highness the Crown Prince's late father [Sheikh Zayed bin Sultan Al Nahyan] were good friends who formed an important alliance against Guinea worm disease. That rich partnership has endured through three generations, and I believe it will go on even after Guinea worm disease is eradicated."

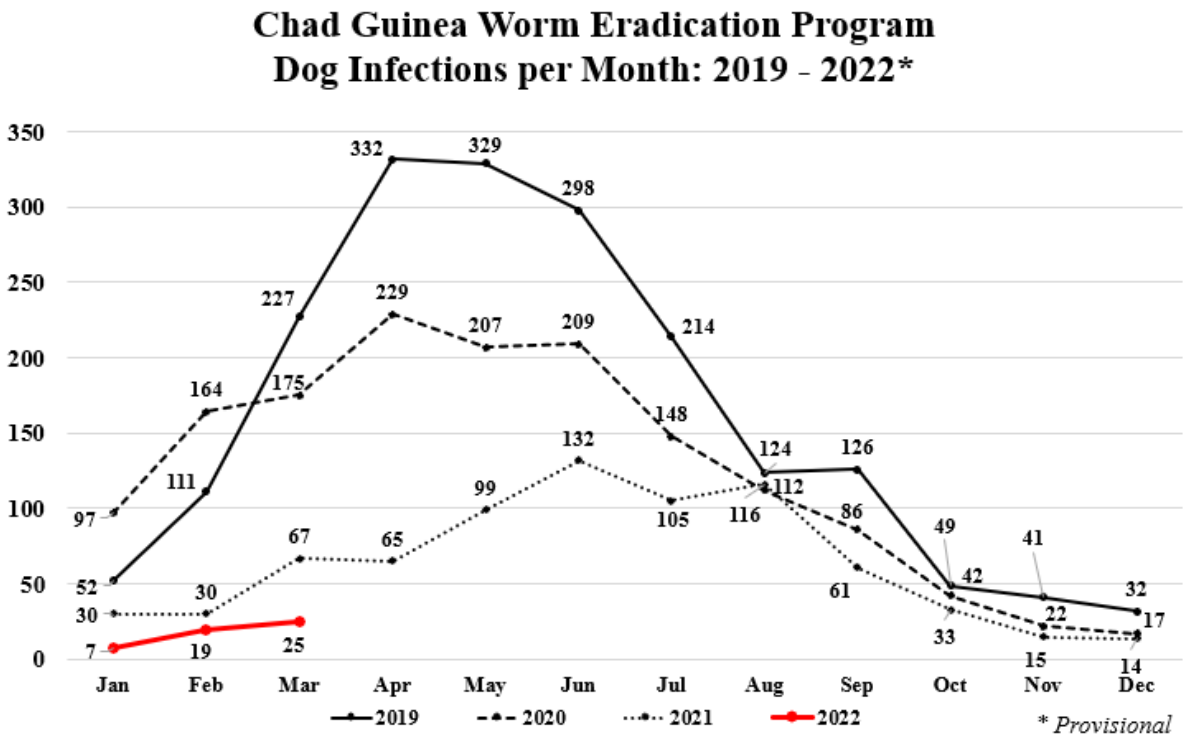
At the Summit's conclusion on March 22nd, World Water Day, country representatives signed the "Abu Dhabi Declaration for the Eradication of Guinea Worm Disease" in the presence of Sheikh Shakhbout, Jason Carter, and Dr. Tedros, among others, at the Qasr Al Watan Palace in Abu Dhabi. The Declaration signatories committed to help ensure bold involvement of political leaders in community-targeted advocacy visits, sufficient funds for national elimination programs, rapid provision of safe water to all dracunculiasis-endemic villages by 2024, and vigorous efforts towards safe working conditions for health workers in areas of conflict.

Other Summit participants included The Carter Center's CEO Paige Alexander, Vice President for Health Dr. Kashef Ijaz, Guinea Worm Eradication Program Director Adam Weiss, Chief Development Officer Curtis Kohlhaas, and Associate Director of Communications Emily Staub, as well as the WHO Assistant Director General Dr. Ren Minghui, and the WHO/NTD Team Lead for Eradication and Elimination Dr. Dieudonne Sankara, Social Media Team of WHO headquarters Ms. Aleksandra Kuzmanovic, and focal point for GWE at the Regional Office for Africa Dr. Andrew Seidu Korkor, and Lina Jalouqa of UNICEF's Gulf Area office. Key donor representatives included Her Royal Highness Princess Lamia bint Majed AlSaud, the Secretary General, Alwaleed Philanthropies, Tala Al Ramahi, Director, Crown Prince Court, James Carty, Interim Deputy Director of Global Policy and Advocacy, Bill & Melinda Gates Foundation, and

Ms. Faustina Fynn-Nyame of the Children's Investment Fund Foundation. Representatives of Mali, an endemic country, were unable to attend the event. A video tribute to the campaign's "Guinea Worm Warriors" was unveiled at the summit (see electronic link above). The Summit was hosted by Reaching the Last Mile, an initiative of His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, and The Carter Center, with additional support by the Global Institute for Disease Elimination and Purehealth.

CHAD REDUCES DOG INFECTIONS BY ANOTHER 60% SO FAR IN 2022

Figure 2



Following its reductions in animal Guinea worm infections of 20% between 2019 and 2020, and 48% in 2020-2021, Chad has provisionally reported 51 dogs with Guinea worm infections in January-March 2022, for a reduction of 60% compared to 127 infected dogs in the same three months of 2021. Chad also had two confirmed human cases of Guinea worm in February 2022. One of the cases has been reported contained and the other has been reported uncontained. A line list will be included in the next issue.

INTERNATIONAL GW REVIEW MEETS VIRTUALLY; 15 CASES IN 2021

About 110 persons participated in the 25th International Review Meeting of Guinea Worm Eradication Program Managers organized by The Carter Center in cooperation with the World Health Organization that met virtually on March 9-11, 2022. Carter Center Chief Executive Officer Paige Alexander and World Health Organization Director-General Dr. Tedros Ghebreyesus greeted participants in recorded videos. National Program Coordinators from the five endemic countries (Angola, Chad, Ethiopia, Mali, South Sudan), two pre-certification countries (Democratic Republic of the Congo, Sudan) and one country with cross-border infections (Cameroon) presented final data for 2021. An important update from the provisional data reported earlier is that Chad had an additional human Guinea worm case in 2021 whose confirmation was delayed because the worm specimen was misplaced temporarily in shipment. Human Guinea worm cases thus declined from 27 to 15 between 2020 and 2021, a reduction of 44%. Guinea worm infections in animals declined by 46%, from 1,601 to 863 in the same year. Two-thirds (10/15) of the human cases reported in 2021 were 13 years old or younger. Other key points from the presentations and discussions are summarized below. The summaries of coverage by key intervention indices in Chad, Ethiopia, Mali and South Sudan are in Figure 3.

CHAD reported 8 human cases (75% contained) and 832 animal infections (623/767, or 81% dogs contained; 48/65, or 74% of cats contained) in 2021. Table 1 is an updated line listing of Chad's human infections. Sixty-three percent (5/8) of Chadian GW cases were less than 8 years old in 2021, compared to an average 10% less than 8 years old in 2010-2020.

Table 1

Human Guinea worm cases in Chad, 2021

Case #	Province	District	Zone*	Village of Detection	Age	Sex	Date of Emergence	Contained? (Yes/No)	Imported case? (Yes/No)	Known source of infection? (Yes/No)	Water contaminated? (Yes/No)	Abate® applied in 7 days? (Yes/No)
1	SLM	Amtiman	Gozdjarat	Amdabri	22	F	01 Feb	Yes	No	Yes	No	N/A
2	MC	Kyabe	Marabe	Bodobo-1	3	F	30 Mar	Yes	Yes	Yes	No	N/A
3	SLM	Aboudeia	Liwi	Bogam	7	M	14 Apr	Yes	No	Yes	No	N/A
4	MDL	Moissala	Beboro	Balimba	7	M	19 Apr	No	No	No	No	N/A
5	MKE	Guelendeng	Guelendeng 1	Medegue	3	F	22 July	Yes	No	Yes	No	N/A
6	SLM	Amtiman	Mirere	Alhilela	6	M	29 July	No	No	Yes	Yes	Yes
7	CB	Bousso	Mogo	Mogo	41	M	09 Oct	Yes	No	Yes	No	N/A
8	SLM	Haraze	Massambagne	Ndarbagne	28	F	28 Nov	Yes	No	No	No	N/A

*All zones are Level 1 surveillance

The new Minister of Public Health and National Solidarity Dr. Abdoulmadjid Abderahim and the Secretary-General Dr. Ishmael Barh Bachar both addressed the review meeting, in addition to National Program Coordinator Dr. Ouakou TCHINDEBET, who presented Chad's report. With two successive years of reductions in Guinea worm infections in humans and animals attributed largely to increased application of Abate and the new strategy of proactive tethering, Chad's Guinea Worm Eradication Program has gained new courage and confidence. The Ministry of Public Health is working to engage other government ministries, including Environment and Fisheries, Livestock and Animal Husbandry, and Urban and Rural Hydraulics in the campaign, and is seeking to re-enlist UNICEF assistance for providing safe drinking water to endemic communities.

Chad GWEP Surveillance Snapshot 2021
Accessibility: 100%
Villages reporting 1+ GW infection: 353
Number of districts by surveillance level: 27 in level 1; 3 in level 2; 99 in level 3
Villages under Active Surveillance (VAS): 2309 (2190 level 1; 119 level 2)
Monthly reporting rate for VAS: 100%
Number of rumors: humans 71,259 (98% investigated in 24h), 110,686 animals (97% investigated in 24h)
Cash reward awareness: 92% humans, 92% animals
Cash reward amount: US$100 equivalent for reporting a confirmed human case, US$20 for reporting a confirmed infected animal
Integrated surveys: 4 surveys in Guelendeng and Moissala districts in February-April
Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): pending
% presumed sources of human cases identified*: 25% (2/8)
% human and animal Guinea worm infections contained: 81% (677/840)
*see definition page 11

SOUTH SUDAN reported 4 human cases (25% contained) in 2021 (see list in issue #284; on further review the case in Tonj East was ruled NOT contained). The South Sudan GWEP discovered the source of none of these infections, although all 19 infections in 2018-2021 occurred in the original four endemic foci of the country. South Sudan's only known animal GW infection occurred in 2015 in a dog in a household with two human GW cases. SSGWEP Director Mr. MAKOY Samuel Yibi presented the country's report.

South Sudan GWEP Surveillance Snapshot 2021
Accessibility: 100%
Villages reporting 1+ GW infection: 4
Number of districts by surveillance level: 4 in level 1; 10 in level 2; 66 in level 3
Villages under Active Surveillance (VAS): 2,012 (1,401 level 1; 611 level 2)
Monthly reporting rate for VAS: 98%
Number of rumors: humans 48,041 (99% investigated in 24h), animals 548 (99% investigated in 24h)
Cash reward awareness: 84% humans, 68% animals
Cash reward amount: US$75 equivalent for reporting a confirmed human case, US$75 for reporting a confirmed infected animal
Integrated surveys: 1,045,357 persons and 27,894 animals screened for GW in case sweeps
Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 92%
% presumed sources of human cases identified*: 0% (0/4)
% human and animal Guinea worm infections contained: 25% (1/4)
*see definition page 11

MALI reported 2 human cases (50% contained) and 17 animal infections (16 dogs, 1 cat; 10/17 or 59% contained) in 2021 (see line list in issue #285). Mali's GWEP continues to educate dog vendors in Segou and Mopti Regions despite challenges of insecurity. It applies Abate to known or suspected contaminated water sources within seven days. The program began pilot-testing proactive tethering of dogs in two endemic villages of Djenne and Macina districts of Mopti and Segou Regions, respectively, late in 2021. Mali will prioritize villages at-risk with large dog populations for proactive tethering and conduct daily inspections of all other villages with a known human and/or animal infection. National Program Coordinator Dr. Cheikh Oumar COULIBALY presented this report.

Mali GWEP Surveillance Snapshot 2021
Accessibility: 97%
Villages reporting 1+ GW infection: 13
Number of districts by surveillance level: 5 in level 1; 4 in level 2; 66 in level 3
Villages under Active Surveillance (VAS): 2,216 (1,178 level 1; 1,038 level 2)
Monthly reporting rate for VAS: 91%
Number of rumors: humans 374 (99% investigated in 24h), animals 136 (97% investigated in 24h)
Cash reward awareness: 90% humans, animals
Cash reward amount: US$360 equivalent for reporting a confirmed human case, US$18 for reporting a confirmed infected animal
Integrated surveys: 248 persons (local immunization days)
Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 1,416 (93%)
% presumed sources of human cases identified*: 0% (0/2)
% human and animal Guinea worm infections contained: 63% (12/19)
*see definition page 11

ETHIOPIA reported 1 human Guinea worm case (contained), 2 infected dogs (1 contained), and 1 infected cat (contained) in 2021, compared to 11 humans, 3 dogs, 8 cats, and 4 baboons infected in 2020 (see line lists in issue #284). The Ethiopia Dracunculiasis Eradication Program reduced the number of known emerging Guinea worms in the country by 97% between 2020 and 2021, from 128 worms 4. A significant remaining vulnerability is that several villages and most commercial farms (non-village areas) in endemic areas do not have sources of safe drinking water. National Program Coordinator Mr. Kassahun DEMISSIE presented this report.

Ethiopia DEP Surveillance Snapshot 2021

Accessibility: 100%
Villages reporting 1+ GW infection: 4
Number of districts by surveillance level: 2 in level 1; 14 in level 2; 964 in level 3
Villages under Active Surveillance (VAS): 726 (198 level 1; 528 level 2)
Non-Village Areas under Active Surveillance (NVAs): 296 (192 level 1; 104 level 2)
Monthly reporting rate for VAS & NVAs: 100%
Number of rumors: humans 18,924 (99% investigated in 24h), animals 4,979 (99% investigated in 24h)
Cash reward awareness in levels 1 & 2: 96% humans, 91% animals
Cash reward amount: US$196 equivalent for reporting a confirmed human case, US$20 for reporting a confirmed infected animal
Integrated surveys: 362,796 persons interviewed (polio, immunization, MDA)
Number and reporting rate for Integrated Disease Surveillance and Reporting (IDSR): 20,638 (87%)
% presumed sources of human cases identified*: 100% (1/1)
% presumed sources of animal infections identified: 100% (3/3)
% human and animal Guinea worm infections contained: 75% (3/4)
*see definition page 11

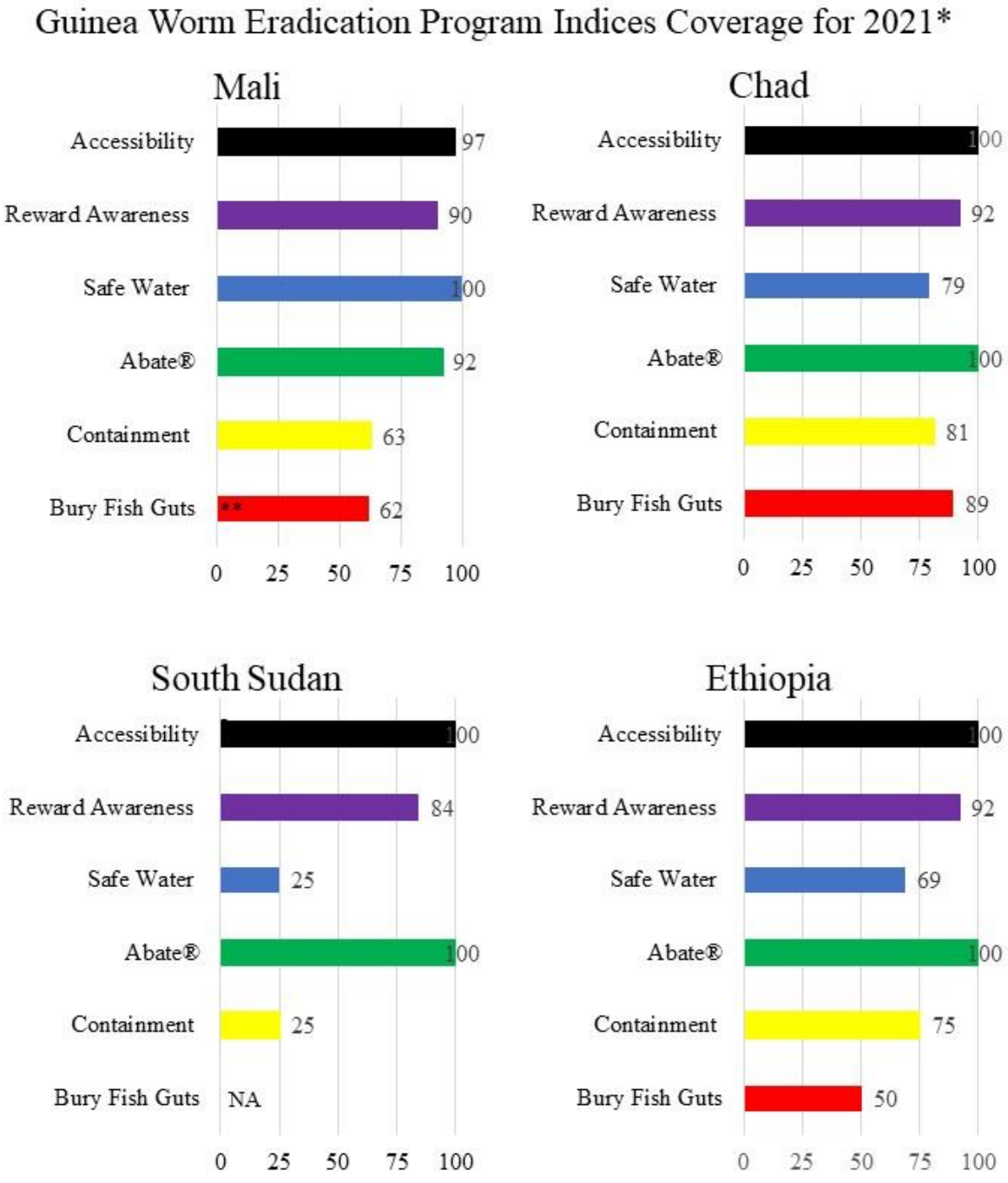
ANGOLA has reported no Guinea worm case in a human or animal GW infection since March 2020, despite expanding community-based active surveillance in at-risk districts, conducting integrated surveys for the disease in cooperation with other public health programs in various parts of the country, and publicizing nationwide a cash reward equivalent to US$450 for reporting a confirmed human case of the disease. This report was presented by the Angola WHO country office Focal Point for Guinea worm eradication, Dr. Sebastiao MAVITIDI assisting Dr. Cecilia DE ALMEIDA, National Coordinator for Neglected Tropical Diseases.

CAMEROON, which reported its last indigenous GW case in 1997 and was certified free of the disease by WHO in 2007, reported 2 human cases (0% contained), 15 infected dogs (67% contained) and 1 infected cat (uncontained) in Guere district which borders endemic Bongor district in Chad, in 2019-2021. The Guinea worm infections and cases in Cameroon are in a population of fishermen and farmers who share ethnicity, family links, and travel on both sides of the border (see discussion in *Guinea Worm Wrap-Up* #285) and are believed to have been infected in Chad. Cameroon is conducting village-based surveillance, health education, application of Abate in appropriate water bodies, and has begun proactive tethering of 600 of 900 targeted dogs in at-risk areas, all in close coordination and cooperation with Chad's GWEP. Cameroon publicizes a cash reward equivalent to US$170 for reporting a confirmed case of Guinea worm disease. Dr. Georges Barthelemy NKO AYISSI, National Program Coordinator – Cameroon Ministry of Health presented this report, assisted by Dr. Etienne NNOMZO'O – WHO country office Focal Point for Guinea worm eradication.

The DEMOCRATIC REPUBLIC OF THE CONGO submitted its dossier on Guinea Worm Eradication activities to the World Health Organization on February 14, 2022. The International Commission for the Certification of Dracunculiasis Eradication (ICCDE) will review the report and consult with DRC's Ministry of Health on timing for sending an International Certification Team to the country to conduct its own on-site reviews and prepare a report and recommendation for consideration by the ICCDE. DRC has not reported a case of Guinea worm disease in 64 years. This report was presented by Dr. Serge NKOY, Coordinator of the National Guinea Worm Eradication Program.

SUDAN's National Certification Committee plans to meet later in March 2022. It expects to submit its dossier to WHO by November 2022 and hopes Sudan will be certified free of Guinea worm by the end of 2023. In the discussion it was mentioned that the area of Sudan of most concern is South Darfur, where GW cases possibly due to contamination from South Sudan were discovered at Kafia Kinji village in 2013. Sudan's last confirmed indigenous case was in 2002. This report was presented by Mr. Elrofaay ABDO, Guinea Worm Disease Officer at the Sudan Federal Ministry of Health.

Figure 3



*See criteria for each indicator in text.
** The MGWEP encourages households to dry fish guts and sell them to chicken farmers.
NA: Not Applicable

RESEARCH REVIEW MEETING

Carter Center Associate Director for Research Dr. Fernando Torres-Velez, DVM, PhD, convened a virtual Research Review Meeting with over 70 participants on March 16, 2022, of researchers supported by The Carter Center on aspects of Guinea worm infections. Topics presented and discussed at the meeting included baboon surveillance in Ethiopia, miRNA biomarkers, simulation modeling of transmission dynamics, studies of Flubendazole for treating infections in dogs in Chad, Guinea worm genomics, copepod ecology, and remote sensing of surface water bodies.

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 3

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										1 / 2	50 %
SOUTH SUDAN	0 / 0	0 / 0	0 / 0										0 / 0	N / A
MALI	0 / 0	0 / 0	0 / 0										0 / 0	N / A
ETHIOPIA	0 / 0	0 / 0	0 / 0										0 / 0	N / A
ANGOLA	0 / 0	0 / 0	0 / 0										0 / 0	N / A
TOTAL*	0 / 0	0 / 0	0 / 0										0 / 0	N / A
% CONTAINED	N / A	50 %	N / A										50 %	

Provisional

Cells shaded in black denote months when zero indigenous cases were reported. Numbers indicate how many cases were contained and reported that month.

Shaded cells denote months when one or more cases of GWD did not meet all case containment standards.

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2021

(Countries arranged in descending order of cases in 2020)

COUNTRIES WITH TRANSMISSION OF GUINEA WORMS	NUMBER OF CASES CONTAINED / NUMBER OF CASES REPORTED													% CONT.
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL	
CHAD	0 / 0	1 / 1	1 / 1	1 / 2	0 / 0	0 / 0	1 / 2	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	6 / 8	75 %
ETHIOPIA	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	100 %
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0	1 / 4	25 %
ANGOLA	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 / 1	1 / 1	0 / 0	0 / 0	0 / 0	1 / 2	50 %
TOTAL	0 / 0	2 / 2	1 / 1	1 / 2	0 / 0	0 / 0	2 / 4	0 / 2	1 / 1	1 / 2	1 / 1	0 / 0	9 / 15	60 %
% CONTAINED	N / A	100 %	100 %	50 %	N / A	N / A	50 %	0 %	100%	50 %	100 %	N / A	60 %	

Cells shaded in black denote months when zero indigenous cases were reported. Numbers indicate how many cases were contained and reported that month.

Shaded cells denote months when one or more cases of GWD did not meet all case containment standards.

RECENT PUBLICATIONS

Grunert R, Box E, Garrett K, Yabsley M, Cleveland C, 2022. Effects of temephos (Abate®), Spinosad (Natular®), and diflubenzuron on the survival of cyclopoid copepods. Am J Trop Med Hyg 106:818-822.

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 Weissof The Carter Center, Dr. Sharon Roy of CDC, and Dr. Dieudonné Sankara of WHO.

WHO Collaborating Center for Dracunculiasis Eradication, Center for Global Health, Centers for Disease Control and Prevention, Mailstop A-06, 1600 Clifton Road NE, Atlanta, GA 30329, USA, email: gwwrapup@cdc.gov, fax: 404-728-8040. The GW Wrap-Up web location is http://www.cdc.gov/parasites/guineaworm/publications.html#gwwp
Back issues are also available on the Carter Center web site English and French are located at *http://www.cartercenter.org/news/publications/health/guinea_worm_wrapup_english.html*.

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

World Health Organization

CDC is the WHO Collaborating Center for Dracunculiasis Eradication