DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control
And Prevention (CDC)

Memorandum

Date: December 16, 2024

From: WHO Collaborating Center for Dracunculiasis Eradication, CDC

Subject: GUINEA WORM WRAP-UP #315

To: Addressees

For each human Guinea worm (GW) case or infected animal:
Where did this GW come from (source)?
Who/what else was at risk there?
What/who has this GW contaminated or exposed now?

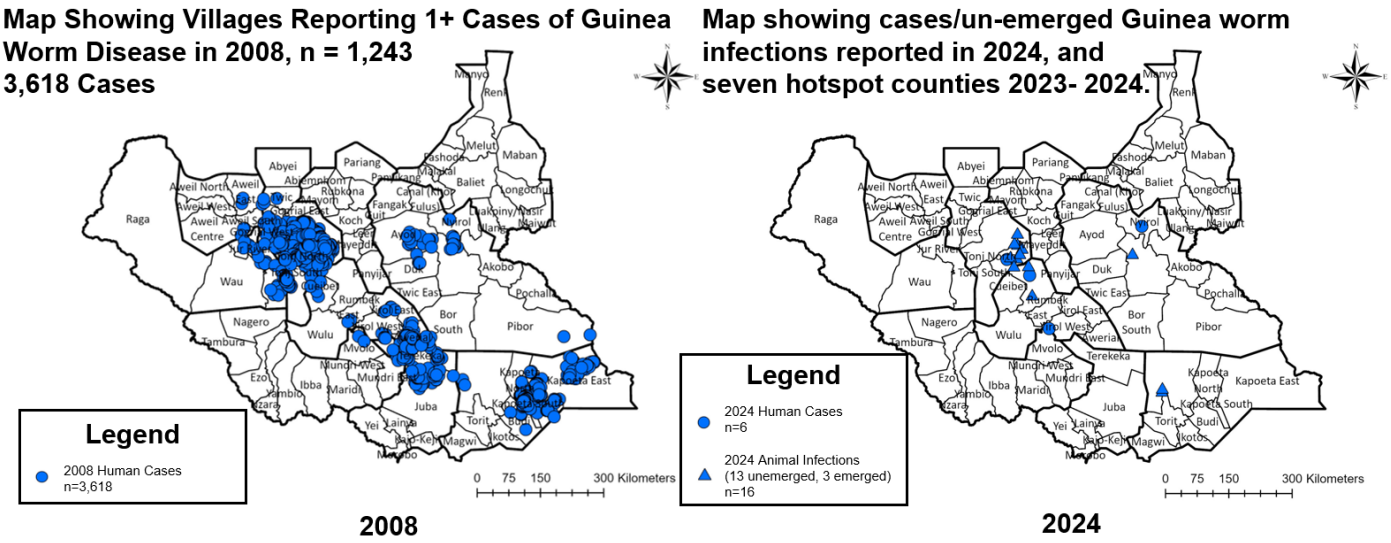

Figure 1. Maps of South Sudan Counties Reporting Guinea Worm 2008 vs 2024

SOUTH SUDAN REPORTS 6 HUMAN CASES

The South Sudan Guinea Worm Eradication Program (SSGWEP) has reported 3 more cases of Guinea worm disease, for a total of 6 confirmed human cases (0% contained) in 2024. The human cases are from Tonj East County (3 cases) in Warrap State, Rumbek North and Yirol West Counties in Lakes State, and Nyirol County in Jonglei State (Table 1). South Sudan also now has detected 13 small felines with un-emerged confirmed Guinea worm infections in five counties in 2024: Tonj East (7), Lafon (2), Rumbek North (2), Rumbek Center (1), and Uror (1), as well as 2 domestic cats (Uror, not contained; Tonj E, contained) and a dog (Rumbek N, contained). This makes a total of seven counties with known Guinea worm transmission in *2023* (South

Sudan has a total of 79 counties). Tonj East County, with 3 uncontained cases and 8 animals with un-emerged or contained worms in 2024, is the hottest of these seven hotspot counties (see *Guinea Worm Wrap-Up* #314 for background on the SSGWEP's increased wildlife surveillance). Figure 1 compares the four Guinea worm-endemic zones in southern Sudan in 2008, when 3,618 human cases were reported in more than a thousand villages, to the currently known endemic areas.

The three new human cases are summarized in Table 1. Case #4 is associated with cases #1 and #3 from the same village (Gaak, in Tonj East County of Warrap State), which has a source of safe drinking water. An unsafe source of drinking water in that village is believed to be the source of the three infections. The presumed mode and location of infection is not clear for either of the other two new infections.

Many human cases reported in South Sudan in recent years have been boys, 14-years-old or younger. According to SSGWEP Director MAKOY Samuel Yibi, the boys eat inadequately cooked fish they catch and prepare while grazing goats, sheep, and cattle in the rainy season and they hunt, roast, and eat small felines while in the bush. The program has also found evidence of dogs scavenging on fish entrails left by the young boys and fishermen. The 13 animals with un-emerged Guinea worms (GWs) did not contaminate any water sources and did not transmit Guinea worm infection in 2024. The 6 uncontained human cases and 1 uncontained domestic cat infection, which occurred in 5 different localities of five counties (Tonj East in Warrap State, Rumbek North and Yirol West in Lakes State, and Nyirol and Uror in Jonglei State) are the only known risks of GW transmission in South Sudan in *2024*, with Gaak village, which had 3 of the human cases and Tonj East County where Gaak village is located also having 7 of the animals with un-emerged GWs, being at highest risk. *In 2025, the SSGWEP needs to apply tight surveillance and preventive interventions in all localities and counties with known GW in 2024 (emerged and un-emerged), with highest priority to the five areas with known contamination by emerged GWs in 2024.*

ETHIOPIA FINDS NO HUMAN CASE; 2 BABOONS WITH EMERGING GWs (ONE CONFIRMED, ONE PROVISIONAL) IN 2024 SO FAR

Working with Ethiopian wildlife authorities in the Baboon Study Project, the Ethiopian Dracunculiasis Eradication Program (EDEP) has reported two baboons with emerging worms (confirmed and provisional). One baboon with an emerging Guinea worm, which is confirmed, was detected in July 2024 in the AK Roadside troop in Gog district of Gambella Region. The other baboon with an emerging provisional Guinea worm was detected in November 2024 in the Balak troop in Gog district. The EDEP has also reported 2 other baboons found with *un-emerged* provisional Guinea worms in the Balak troop in November 2024 and a baboon with confirmed, *un-emerged* Guinea worms in Abobo district of Gambella Region in April 2024. The two baboons with confirmed and provisional Guinea worm infections are the only known or suspected animals or humans with emerging Guinea worms in Ethiopia in 2024. In 2023, Ethiopia detected an emerging Guinea worm in a dog and an *un-emerged* Guinea worm in a serval cat, but no infected human or baboon. Another article in this issue considers the significance of *un-emerged* Guinea worms.

Carter Center GWEP Director Adam Weiss and Dr. Jordan Tappero of the Gates Foundation traveled to Gog and Abobo districts in Gambella Region on November 4-6 to observe baboon research and visit communities. They observed live-trapping and processing of baboons during the Baboon Study Project's third trapping session of 2024. They also visited several villages, a dog park for exercising tethered dogs, a commercial farm, a school, and a health facility. Giovanna Steel and Ato Aragaw Lamesgin also accompanied the team.

ANGOLA

Angola has reported 36 confirmed Guinea worm infections (28% contained) in dogs from January through November 2024. These 36 animals had 42 Guinea worms. Worm specimens from 3 provisional dog infections are being shipped to the CDC laboratory in Atlanta. This is a reduction of 58% compared to the 85 animal infections Angola reported during the same period in 2023. Angola reported 117 rumored Guinea worm infections (63 from humans, 54 from animals) during January-November 2024. The rumors were reported by community members from 62 villages, in Namacunde, Cuanhama, Ombadja, and Cuvelai municipalities in Cunene Province, in addition to Omatangela village in Ohangwena Region in the Republic of Namibia, bordering Namacunde municipality. Ninety (77%) of the rumors were investigated within 24 hours. This is a reduction of 20% from the 146 rumors reported in 2023.

The program conducted several activities in 2024, including training community agents, applying Abate@ larvicide, integrated communication and awareness-raising, and active case finding, including during the national school de-worming campaign and the cross-border "Health Fair" activities organized during Malaria Week.

The new Carter Center Representative in Angola, Lucia Verzotti, visited Namacunde, Cuvelai, and Cuanahama municipalities in Cunene Province during November 24-December 1, 2024, with National Neglected Tropical Diseases Coordinator Dr. Cecilia de Almeida and others in a joint Carter Center-Ministry of Health mission in collaboration with the local World Health Organization (WHO) team. Ms. Verzotti had introductory meetings with administrative authorities, potential partners, and local communities. The WHO country office continues to support development of the multisectoral strategic plan for Guinea worm eradication in Angola 2025-2030, coordinating contribution from other partners. This plan will contribute to addressing the challenge of resource mobilization and financing for Guinea worm eradication in Angola.

GUINEA WORMS EMERGED AND UN-EMERGED

- Animals or humans with emerging and/or un-emerged Guinea worms are equally important indicators of GW transmission the year before.
- Animals or humans with uncontained emerging Guinea worms are potential sources of continuing Guinea worm transmission in the current year.
- Animals or humans with only un-emerged Guinea worm(s) are not a source of contamination or potential Guinea worm transmission in the year they occur. They do not meet the case definition* for Guinea worm disease and are not counted as official Guinea worm infections.
- Implications: *persons or animals with emerging Guinea wor*ms, contained or uncontained, are the highest priority for interventions. Persons, animals, or areas with un-emerged Guinea worms are the next priority for interventions and investigation. The higher the number of known animal infections or human cases, emerged or un-emerged, in a hotspot**, the higher the priority.

*A Guinea worm/dracunculiasis case is defined as an infection occurring in a person exhibiting a skin lesion of lesions with emergence of one or more worms that is laboratory confirmed as *Dracunculus medinensis* at CDC. Because *D. medinensis* has a 10-14-month incubation period, each infected person is counted as having an infection only once during a calendar year. [The same requirement of worm emergence applies to confirmed *D. medinensis* infections in animals.]

** A Guinea worm hotspot is a district or county where an emerging or un-emerged confirmed Guinea worm infection was detected in a human or animal in the current or the previous calendar year.

Table 1. Provisional Line List of Confirmed Human Guinea Worm Cases, 2024 (as of December 10)

Country	District/Village	Sex/Age	Ethnicity	Worm Emerged	Contained?	Presumed Source of Infection	Likely mode of Infection	Number of GWs
Chad	Kyabe/Goho	F/60	Sara Kaba	30 May	No	Indigenous	Aquatic Animal	1
Chad	Kyabe/Moudjousso	M/14	Sara Kaba	3 July	No	Goho	Unclear	1
Chad	Kouno/Seneck	F/7	Goulaye	7 July	No	Kreyaou 1	Unclear	2
Chad	Kouno/Seneck	F/30	Goulaye	5 August	Yes	Kreyaou 1	Unclear	1
Chad	Lai/Hamakara	F/60	Gabri	5 October	Yes	Indigenous	Aquatic Animal	2
S Sudan	Tonj E/Gaak	F/15	Dinka	28 June	No	Indigenous	Water	3
S Sudan	Rumbek N/Bardiak CC	M/7	Dinka	30 June	No	Unknown	Unclear	1
S Sudan	Tonj E/Gaak	M/50	Dinka	25 July	No	Indigenous	Water	1
S Sudan	Tonj E/Gaak	F/20	Dinka	7 July	No	Indigenous	Water	1
S Sudan	Nyirol/Wiyuot	M/28	Nuer	22 July	No	Unknown	Unclear	2
S Sudan	Yirol W/ Mayomathei	F/32	Dinka	26 September	No	Unknown	Unclear	1

CC = Cattle Camp
S Sudan = South Sudan

IN BRIEF:

Chad's fifth human Guinea worm case of 2024 is a 60-year-old Gabri woman who lives in the fishing village of Hamakara on the banks of the Logone River in Lai district of Tandjile Province. Four of six wells in the village are functional. Her first worm emerged on October 5 and a second worm on November 13. The first worm was not contained, while the second worm was contained. This village of 1,083 inhabitants had 2 GW infections in 2022 and 4 infections in 2023. Two other villages close by, Toukouroum and Toulo, also had 1 and 5 GW infections respectively in 2023. The most likely mode of her infection appears to have been from eating inadequately cooked, contaminated fish or other aquatic animal in her home village. Chad has so far reported 274 animal Guinea worm infections, mostly dogs, in 2024, which is a 43% reduction from the 480 infected animals it reported in the same period of 2023. If it finds no other human cases in 2024, this will be the fewest number of cases Chad has reported since it rediscovered GW transmission in 2010.

Mali's Guinea Worm Eradication Program has reported no human cases, but 13 confirmed GW infections in animals (11 dogs, 2 cats; 54% contained), and 14 suspected animal infections (12 dogs, 2 cats; 57% contained) in January-October 2024, vs. 42 animal infections and 1 human case (78% contained) in the same period of 2023, which is a 36% reduction in animal infections if all the suspected infections are confirmed. Fourteen (50%) of these confirmed and suspected infections were in Macina district of Segou Region. As of November 2024, Macina district had tethered 80% (595/746) of targeted dogs and 86% (569/661) of targeted cats, while 86% (332/386) of households surveyed and 82% (18/22) of fish sellers surveyed practiced proper disposal of fish guts in October 2024. All 11 1+ villages in Macina have at least one source of safe water. Flooding prevented application of Abate in endemic villages of Macina in September. Two of Macina's 1+ villages were not accessible to the district GW Team in October because of insecurity. Mali reported 895 rumors of animal GW infections in January-October 2024 vs. 518 rumors in January-October 2023, and 170 rumors of human GW cases in 2024 vs. 171 in 2023.

Cameroon has reported 312 animal GW infections (35% contained) in January-October 2024, compared to 254 animal infections in the same period of 2023, for a 23% increase in animal infections and surpassing the number of animal GW infections reported in Chad, which formerly reported the most animal infections. Cameroon has reported no human case in 2024; it reported one human case in 2023 (May).

SUDAN: CERTIFICATION PREPARATIONS CONTINUE DESPITE INSECURITY

In 2024, Sudan's National Neglected Tropical Diseases Program continued its preparations for certification of Guinea worm eradication in accessible areas, despite the ongoing conflict in the country since April 2023. The country has never reported an animal with Guinea worm infection. The most recent human Guinea worm cases in Sudan occurred in Kafia Kingi village of South Darfur State in 2013. In recent years, the World Health Organization has provided supportive missions to assist the Ministry of Health in preparing for certification. However, the International Commission for the Certification of Dracunculiasis Eradication cancelled a planned visit by an International CertificationTeam in 2023 due to insecurity.

Significant efforts were undertaken to prepare Sudan for certification. In 2024 alone, GW surveillance has been strengthened through training and capacity building of healthcare providers and community-based volunteers. The program responded to 164 rumors of Guinea worm infection (159 in formerly endemic areas, 5 in never endemic areas) in January – November 2024; all were ruled out.

Table 2. Number of Personnel Trained and Sensitized on GW Surveillance in 2024

States	Event Base Surveillance (EBS)				Total	Community-Based Surveillance (CBS)					Total
	Feb	April	Jun	Oct		Jan	Feb	March	May	Oct	
White Nile	24	0	120	0	**144**	25	35	0	35	0	**95**
Blue Nile	0	0	0	0	**0**	0	0	0	37	0	**37**
Red Sea	0	0	41	0	**41**	0	60	30	120	40	**250**
River Nile	0	0	0	0	**0**	0	0	0	0	432	**432**
Kassla	0	0	0	76	**76**	0	0	0	0	0	**0**
Sennar	0	52	108	0	**160**	0	0	0	0	0	**0**
Northern	0	0	0	20	**20**	0	0	0	0	0	**0**
TOTAL	**24**	**52**	**269**	**96**	**441**	**25**	**95**	**30**	**192**	**472**	**472**

In 2024, the states of White Nile, Blue Nile, Red Sea, River Nile, Kassala, Sennar, and northern states continued their efforts to implement and integrate training and sensitization activities regarding guinea worm disease to strengthen surveillance systems despite the security challenge in Sudan. A total of 441 individuals were trained in event-based surveillance, and 472 community-based volunteers received sensitization training (Table 2).

In South Darfur State, trained Guinea worm community health workers are actively conducting surveillance for Guinea worm disease. However, security concerns have prevented supervision of implemented activities.

In South Kordofan State, the Sudan Guinea Worm Eradication Program (GWEP) is actively coordinating with health authorities in the Nuba Mountains and Khor Yaboos areas. This collaboration, supported by the South Sudan GWEP and WHO, focuses on training health staff on Guinea worm surveillance and response including Guinea worm rumour investigations. This collaborative approach is key to the success of disease surveillance in these hard to access areas.

From October to December 2024, the program plans to conduct active search campaigns for Guinea worms in both human and animals, to distribute reporting forms and health education materials, and supervise and assess Guinea worm activities in all counties in the Nuba Mountains and Khor Yaboos areas. Additionally, billboards and posters will be used to raise public awareness about the cash reward for reporting Guinea worm disease.

GUINEA WORM WARRIOR DR. ANDREW SEIDU KOROR RETIRES FROM WHO

Dr. Andrew Seidu Korkor, MD, MPH, retired from the World Health Organization at the end of November 2024. He was most recently Medical Officer, Neglected Tropical Diseases, based at the WHO Regional Office for Africa, in Brazzaville, Republic of Congo. Among other duties, he helped support Guinea worm eradication activities in the African region, most recently with special attention to newly discovered transmission in Cameroon and Angola, and certification of Guinea worm eradication in Ghana, Kenya, and the Democratic Republic of the Congo. Before joining WHO in 2013, Dr. Seidu Korkor became deputy director of Ghana's Guinea Worm Eradication Program in 1998, while continuing as senior medical officer for the Northern Region, and later became director of the GGWEP himself. Ghana was the second-highest endemic country for Guinea worm disease in the world when it launched its program in 1988. It eliminated the disease under his leadership in 2010 after an arduous 22-year-long struggle. Dr. Seidu Korkor earned his medical degree from the University of Ghana in 1987 and his MPH degree from the University of Leeds. He is a Fellow of the Ghana College of Physicians (Public Health). We wish you a long and happy retirement, Andrew. Thank you!

CDC GUINEA WORM WARRIOR DR. SHARON ROY RETIRES

Dr. Sharon Roy MD, MPH retired from the Centers for Disease Control and Prevention at the end of November. Dr. Roy joined CDC as an Epidemic Intelligence Service officer in 2001 after obtaining her medical degree from the University of Alberta, Canada, completing a family medicine residency, practicing in rural areas of Canada and Australia for five years, and earning a Master of Public Health degree and completing a Preventive Medicine Residency at Johns Hopkins University. She worked in CDC's Division of Parasitic Diseases and Malaria for over fourteen years and became Director of the World Health Organization (WHO) Collaborating Center for Dracunculiasis Eradication at CDC in 2005. She was an advisor to the International Commission for the Certification of Dracunculiasis Eradication (ICCDE) since 2007. Dr. Roy participated in or supported CDC staff in 19 national pre-certification or certification missions and worked with the ICCDE, WHO, and The Carter Center to help initiate and implement an enhanced scientific agenda for dracunculiasis operational research.

Thank you, Sharon, for your contributions to the GWEP and the ICCDE, and for your valued help in editing and distributing the *Guinea Worm Wrap-Up.* We shall miss you! Thank you, and Godspeed!

MEETINGS

Chad GWEP Review Meeting—January 21 – 22, 2025

Ethiopia GWEP Review Meeting—February 6 – 7, 2025

South Sudan GWEP Review Meeting—February 4 – 5, 2025

Mali GWEP Review Meeting—February 20 – 21, 2025

Table 3.

Number of Laboratory-Confirmed Human 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	0 / 1	0 / 0	0 / 2	1 / 1	0 / 0	1 / 1			2 / 5	40%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 2	0 / 3	0 / 0	0 / 1	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	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	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	N / A
TOTAL*	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 2	0 / 5	1 / 1	0 / 1	1 / 1			2 / 11	18%
% CONTAINED	N / A	N / A	N / A	N / A	0%	0%	0%	100%	0%	100%			18%	

Provisional

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.

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	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.

RECENT PUBLICATIONS

Hopkins DR, Weiss AJ, Yerian S, Zhao Y, Sapp SGH, Cama VA, 2024. Progress toward global dracunculiasis (Guinea worm disease) eradication, January 2023-June 2024. MMWR Morb Mortal Wkly Rep 73(44):991-998. https://www.cdc.gov/mmwr/volumes/73/wr/mm7344a1.htm?s_cid=mm7344a1_w

Ruiz-Tiben E, Eberhard ML, Roy SL, 2024. Dracunculiasis (Guinea Worm Disease) Eradication, pp90-119. In: *The Principles and Practice of Disease Eradication*. Edited by Joel G. Breman and Jon Kim Andrus. Oxford: Oxford University Press.

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. Mary Kamb at CDC (gwwrapup@cdc.gov).

Note to contributors: Submit your contributions via email to Dr. Mary Kamb (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. Mary Kamb of CDC, Tara Brant of CDC, and Dr. Dieudonné Sankara of WHO. Formatted by Diana Yu.

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

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

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

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