



Date: October 26, 2020
From: WHO Collaborating Center for Dracunculiasis Eradication, CDC
Subject: GUINEA WORM WRAP-UP #272
To: Addressees

Detect and Contain Every Guinea Worm!

SOUTH SUDAN: DOCUMENTING THE ROAD TO ZERO



The South Sudan Guinea Worm Eradication Program (SSGWEP) began as an autonomous entity in 2006, when it enumerated 20,581 cases of Guinea worm disease in the area that became the sovereign Republic of South Sudan on July 9, 2011. After reporting zero cases of Guinea worm disease nationwide for the first time in 2017, which disappointingly turned out to be a false negative, the SSGWEP redoubled surveillance and interventions for Guinea worm disease in the country.

Figure 1

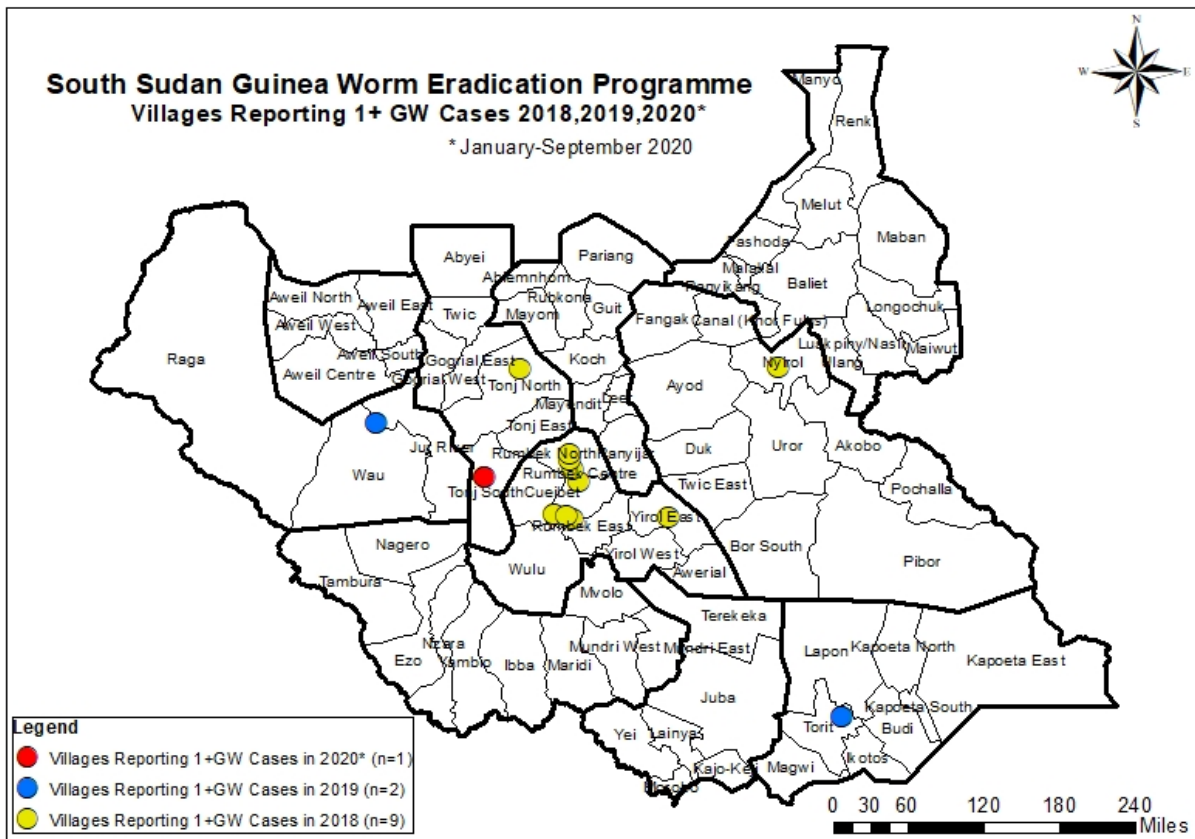


Table 1 shows the impact of interventions since 2017, with steady reductions in Guinea worm cases, affected villages, and emerging worms between 2018 and January-August 2020, as well as key indicators of Guinea worm surveillance in the country. Fifty-five of the 57 specimens submitted to the CDC laboratory in 2019 were from humans and two were from animals; the SSGWEP has submitted 17 specimens from humans and 21 from animals through August 2020. The 15 confirmed cases detected since 2017 were from 12 different localities (**Figure 1**); seven were males and 11 were 15 years-old or older. Three of the four cases in 2019 were in the same household: a mother, father, and their 14-year-old daughter. The program contained 47% (7/15) of the cases, 71% (25/35) of the worms, and applied Abate within seven days for most cases, where appropriate.

Table 1

South Sudan Guinea Worm Eradication Program			
Impact and Surveillance, 2018-2020*			
	2018	2019	2020*
<u>IMPACT</u>			
# of Affected Localities	9	2	1
# of Infected Humans	10	4	1
# of Guinea Worms	22	12	1
<u>SURVEILLANCE</u>			
# of Villages Under Active Surveillance / % Reporting Monthly	2,165 / 100%	2,786 / 87%	2,162 / 84%
Persons Reached in Integrated Surveys	N/A	128,604	N/A
# of IDSR Reporting Units / % Reporting	80** / 89%	1434 / 58%	1434 / 76%
% Reward Awareness / Amount	72% / US\$318	73% / US\$300	TBD*** / US\$301
# of Rumors / % Investigated within 24 Hours	36,239 / 99%	66,440 / 98%	41,463 / 99%
# of Laboratory Specimens Submitted to CDC	40	57	38
* <i>Provisional, January - August 2020</i>			
** <i>In 2018, IDSR reporting units were counties, not health facilities.</i>			
*** <i>The SSGWEP is currently conducting assessments to measure knowledge of the cash reward.</i>			
N/A = <i>Not applicable</i>			

The Guinea worm program’s inability to trace the source (see definition elsewhere in this issue) of any of the infections in 2018-2020 despite thorough case investigations is partly due to extreme mobility associated with cattle herding in South Sudan as well as frequent population displacements and inaccessibility because of insecurity. It probably also reflects previously undetected chains of transmission. It is testimony to the SSGWEP’s effectiveness however, that each of these sparks of infection was extinguished as soon as they were detected. The SSGWEP has only found one animal with a confirmed Guinea worm infection, which was a dog in a household with human Guinea worm cases in 2015. The increasingly helpful genetic profiling of

worm specimens so far has not established links between worms in different localities or successive years in South Sudan, although preliminary indications are that the genetic diversity of recent Guinea worms in South Sudan appears to be less than that of worms in Mali, Ethiopia, and Chad. The diminished number of Guinea worms being detected is also an indirect indicator of reduced potential parasite diversity in South Sudan.

CHAD



Chad has reported 11 confirmed human cases of Guinea worm disease (36% contained), 1,366 dog infections (85% contained), 60 infected domestic cats (89% contained), and one infected wild cat (uncontained) in January-September 2020. An updated line list of the human cases is included in **Table 2**. Two of this year's cases (#7, #8) occurred in the village of Bogam (Aboudeia district/Salamat Region), which was the site of the common source outbreak in 2019. Case #9 occurred in the same village, Bemadjirondjo (Sarh district/Moyen Chari Region), where last year's case #25 occurred in June 2019. The presumed sources (see definition elsewhere in this issue) of Chad's seven other cases in 2020 are unknown. **Figure 2** is an updated line graph of dog infections in 2019 and so far in 2020. Chad's GWEP held a Task Force Meeting on October 13, 2020 at the conference hall of the Ministry of Public Health to review the status of Guinea worm disease in Chad. Participants from WHO, UNICEF and Lions Club attended, among others.

Figure 2

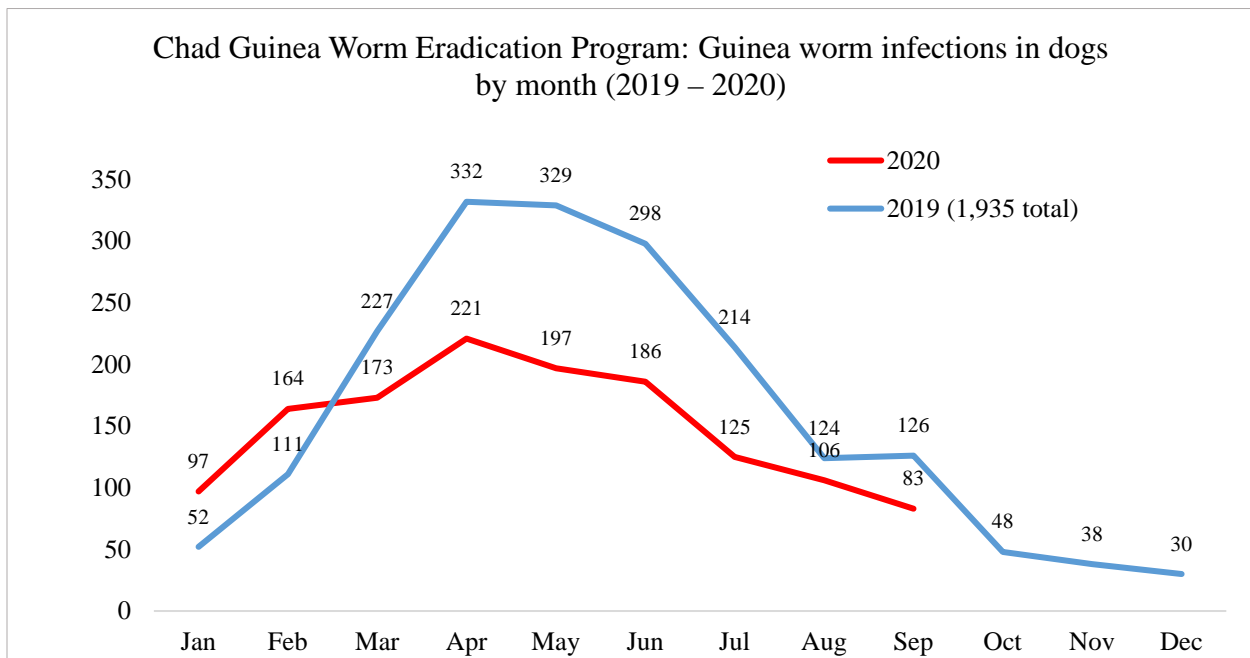


Table 2

**Chad Guinea Worm Eradication Program
Line Listing of Confirmed Cases January - September 2020**

Case #	Age	Sex	Ethnicity	Occupation	Village of Detection	Zone	District	Region	Date of Detection	Date of Emergence	Contained (Y/N)	Entered water
1	32	M	Marba	Farming	Bouar Baguirmi	Gambarou	Mandelia	Chari Baguirmi	3-Jan	3-Jan	Y	N
2	11	F	Sara Kaba	Child	Kyabe	Kyabe	Kyabe	Moyen Chari	16-Feb	16-Feb	N	N
3.1	10	M	Daye	Child	Kemkian	Kemkian	Sarh	Moyen Chari	1-Mar	1-Mar	N	Y
3.2	10	M	Daye	Child	Kemkian	Kemkian	Sarh	Moyen Chari	1-Mar	1-Mar	N	Y
4	43	F	Goulaye	Housewife	Congo Sara	Banda	Sarh	Moyen Chari	4-Mar	8-Mar	N	Y
5.1	10	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	4-Mar	9-Mar	N	N
5.2	10	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	21-May	21-May	N	-
6.1	8	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	19-Mar	6-Apr	N	N
6.2	8	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	6-Apr	6-Apr	N	N
6.3	8	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	21-Apr	24-Apr	N	N
6.4	8	M	Hadjarai	Child	Marabodokouya I	Marabe	Kyabe	Moyen Chari	21-Apr	24-Apr	N	N
7	6	M	Arabe	Child	Bogam	Liwi	Aboudeia	Salamat	5-Apr	9-Apr	Y	N
8.1	8	F	Arabe	Child	Bogam	Liwi	Aboudeia	Salamat	9-Apr	7-May	Y	N
8.2	8	F	Arabe	Child	Bogam	Liwi	Aboudeia	Salamat	13-May	28-May	Y	N
9	41	M	Koulfa	Pecheur	Bemadjirondjo	Kemata	Sarh	Moyen Chari	30-Apr	19-May	Y	N
10	20	M	Arabe	Sentinelle	Matadjana	Matadjana	Matadjana	Wadi-Fira	9-Jul	10-Jul	N	N
11.1	32	F	Baguirmi	Farming	Naraye	N'djamena Bousso	Bousso	Chari Baguirmi	13-Aug	13-Aug	N	Y
11.2	32	F	Baguirmi	Farming	Naraye	N'djamena Bousso	Bousso	Chari Baguirmi	13-Aug	17-Aug	N	Y
11.3	32	F	Baguirmi	Farming	Naraye	N'djamena Bousso	Bousso	Chari Baguirmi	13-Aug	19-Aug	N	Y

ETHIOPIA



The Ethiopia Dracunculiasis Eradication Program (EDEP) has reported 9 confirmed human cases of Guinea worm disease (all contained), 8 infected domestic cats (all contained), 3 infected dogs (all contained), and 4 infected baboons (uncontained) from January through early October 2020. Line lists of the human and animal infections were included in *Guinea Worm Wrap-Up* #271. The human cases are attributed to two separate common source outbreaks where humans shared drinking water from Lel Bonge Pond near Duli village in Gog district/Gambella Region, or Ogul Ponds in Abawiri Forest of Gog district/Gambella Region.

On October 11th, the EDEP detected the 11th case (provisional) in a 40-year-old man who travelled in 2019 to the forest area around Ogul ponds. He overnighted around Ogul pond and shared water collected by cases #8 and #9 of 2020. The four cases (including 2 suspect cases) associated with this outbreak all travelled from Pugnido Refugee Camp (PRC) to the forest in Abawiri for wood and stick collection, and hunting between August and October 2019.

Ethiopia appointed a new Minister of Health effective on March 12, 2020: Her Excellency Dr. Lia Tadesse Gebremedhin. Minister Gebremedhin earned MD and Masters (Health Care and Hospital Administration) degrees from Jimma University and completed a residency in Obstetrics and Gynecology at Addis Abba University. She had worked for almost five years at St. Paul Hospital Millennium Medical College as CEO and Vice-Provost and served as State Minister of Health from November 2018 through March before being appointed Minister. Welcome Dr. Gebremedhin!!

MALI



Mali has reported one confirmed human case of Guinea worm disease (uncontained) and 8 confirmed infected dogs (4 contained). The human case is a 15-year-old girl, whose worm emerged at her home in Konobougou town in Baraoueli district of Segou Region. Her only travel near the period when she most likely became infected was a visit to the village of Komara in Macina district of Segou Region from June to September 2019 (see map in *Guinea Worm Wrap-Up* #268). A line list of these infections is included in **Table 3**. These nine infections are from 6 different villages or localities in three districts of Segou Region and one district of Mopti Region (**Figure 3**) which are in the Inland Delta of the Niger River. Seven (7) of the infected dogs in 2020 were detected in the same villages where they resided the year before their infection. They produced a total of 13 Guinea worms. All seven dogs except dog #6 have histories of eating fish, including fresh fish (dogs #4, #5 #7 and #8). Dogs #4 and #5 do not meet the criteria for determining a presumed source of infection (as defined elsewhere in this issue).

Mali has a new Minister of Health: Dr. Fanta Siby formerly with UNICEF and a former Director of Health of Bamako District. Welcome Dr. Siby!!

Figure 3

HUMAN CASES AND ANIMAL INFECTIONS OF GUINEA WORM IN MALI 2019-2020

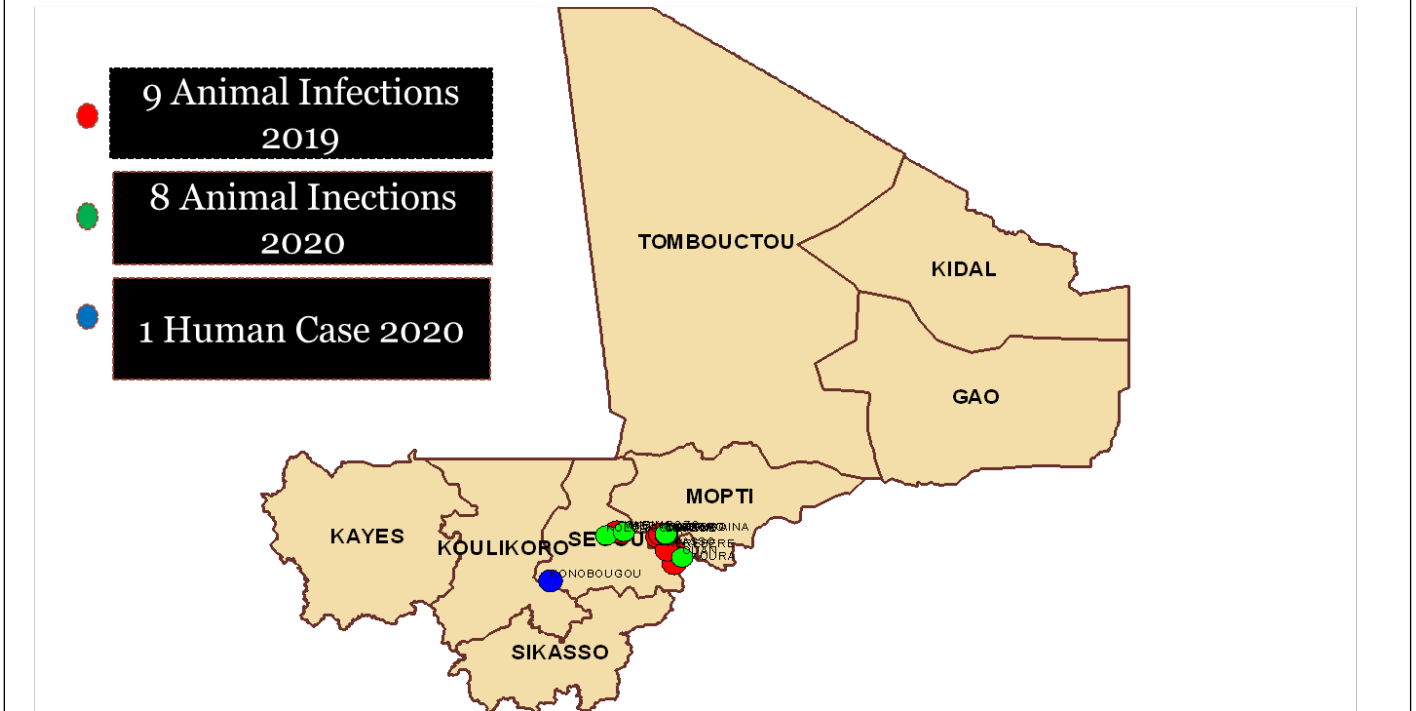


Table 3

**Mali Guinea Worm Eradication Program
Line Listing of Human Case and Animal Infections, January – September 2020**

Case #	Region	District	Health Zone	Village	Ethnicity	Profession	Host	Probable Origin	Date of Detection	Date of Emergence	Entered Water?	Water Source Treated? (Y/N)	Contained (Y/N)	Total # of worms
1	Segou	Baroueli	Konobougou	Konobougou	Bozo	House wife	Human	Komara (Macina)	23-Mar	23-Mar	No	No	No	2
2	Segou	Tominian	Ouan	Ouan	Bobo	Farming	Dog	Djenne	12-Jul	12-Jul	Probable	Yes	No	1
3	Segou	Macina	Kolongotomo	Kolongotomo Bozo	Minianka	Farming	Dog	Kolongotomo Bozo	13-Aug	13-Aug	Probable	Yes	No	2
4	Mopti	Djenné	Djenné Central	Djenné town (Youbkaina)	Peulh	Farming	Dog	Djenne	19-Aug	19-Aug	Probable	Yes	Yes	1
5	Segou	Macina	Kolongotomo	Kolongotomo Bozo Hamlet	Bambara	Farming	Dog	Unknown	27-Aug	28-Aug	Probable	Yes	No	4
6	Segou	Macina	Macina Central	Macina town (Némabougou Bellah Wéré)	Bozo	Farming	Dog	Unknown	1-Sep	2-Sep	Probable	No	Yes	1
7	Mopti	Djenne	Djenné Central	Doteme(Djenné town)	Peulh	House wife	Dog	Djenne town	12-Sep	12-Sep	Probable	No	No	2
8	Segou	Macina	Kolongotomo	Kolongotomo Bozo	Bozo	Fishing	Dog	Kolongotomo Bozo	14-Sep	15-Sep	No	No	Yes	1
9	Mopti	Djenne	Djenné Central	Dioboro(Djenne town)	Bozo	Fishing	Dog	Djenne town	18-Sep	22-Sep	No	No	Yes	1

Table 4

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2020*[^]
(Countries arranged in descending order of cases in 2019)

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 [^]	1 / 1	0 / 2	0 / 3	1 / 2	2 / 2	0 / 0	0 / 1	0 / 1	0 / 0				4 / 12	33%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0				1 / 1	100%
ANGOLA	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0				0 / 1	0%
ETHIOPIA	0 / 0	0 / 0	0 / 0	7 / 7	0 / 0	0 / 0	0 / 0	2 / 2	0 / 0				9 / 9	100%
MALI [§]	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0				0 / 1	0%
TOTAL*	1 / 1	0 / 2	0 / 5	8 / 9	2 / 2	0 / 0	1 / 2	2 / 3	0 / 0				14 / 24	58%
% CONTAINED	100%	0%	0%	89%	100%		50%	67%					58%	

*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.

§Reports include Kayes, Koulikoro, Segou, Sikasso, and Mopti, Timbuktu and Gao Regions; contingent on security conditions during 2018, the GWEP continued to deploy one technical advisor to Kidal Region to oversee the program.

[^] Cameroon reported one case in February that was most likely infected in Chad.

Number of Laboratory-Confirmed Cases of Guinea Worm Disease, and Number Reported Contained by Month during 2019[^]
(Countries arranged in descending order of cases in 2018)

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 / 2	1 / 1	1 / 2	2 / 3	8 / 13	6 / 10	3 / 5	3 / 7	2 / 4	0 / 0	0 / 2	0 / 0	26 / 49	53%
SOUTH SUDAN	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	0 / 0	0 / 0	0 / 0	2 / 4	50%
ANGOLA	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	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	0%
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	0%
TOTAL*	0 / 3	1 / 1	1 / 2	2 / 3	8 / 13	6 / 10	3 / 6	4 / 8	3 / 6	0 / 0	0 / 2	0 / 0	28 / 54	52%
% CONTAINED	0%	100%	50%	67%	62%	60%	50%	50%	50%	#DIV/0!	0%		52%	

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.

§Reports include Kayes, Koulikoro, Segou, Sikasso, and Mopti, Timbuktu and Gao Regions; contingent on security conditions during 2018, the GWEP continued to deploy one technical advisor to Kidal Region to oversee the program.

[^] Cameroon reported one case in March that was most likely infected in Chad.

FOURTEENTH MEETING OF THE ICCDE

The International Committee for the Certification of Dracunculiasis Eradication (ICCDE) held its Fourteenth Meeting virtually on October 8, 2020 under the chairmanship of Dr. Joel Breman. World Health Organization (WHO) Director-General Dr. Tedros Adhanom Ghebreyesus greeted participants by video. The meeting reviewed the status of preparations for certification of the Democratic Republic of Congo and Sudan. Neither country has completed its Country Report to the ICCDE, which recommended that DRC, Sudan and WHO take advantage of the current “window of opportunity” in each country to complete the activities and documentation needed before those two countries can be considered for certification. The Commission also heard some updates on research in support of the Guinea Worm Eradication Program, including recommendations from a working group that considered guidelines for certifying countries with Guinea worm infections in animals.

DR. KASHEF IJAZ NAMED VICE-PRESIDENT FOR HEALTH PROGRAMS AT THE CARTER CENTER



The Carter Center has appointed Dr. Kashef Ijaz, MD, MPH as the new Vice President for Health Programs at the Center, effective October 1, 2020. A medical epidemiologist, Dr. Ijaz was previously the Principal Deputy Director for the Division of Global Health Protection in the Center for Global Health at the U.S. Centers for Disease Control and Prevention (CDC). After beginning his career as a medical epidemiologist in the Division of Tuberculosis at the Department of Health in Little Rock, Arkansas, he held successive leadership positions after joining CDC in 2002. He has worked extensively in Asia, Africa, Europe, and the Americas on tuberculosis, malaria, and Ebola. Dr. Ijaz earned his Doctor of Medicine at King Edward Medical College, University of Punjab in Lahore, Pakistan, and his Master of Public Health at the School of Public Health, University of Oklahoma Health Sciences Center, Oklahoma, USA. Welcome, Dr. Ijaz!!

Dr. Ijaz succeeds Dr. Dean Sienko, MD, MS, GWW, (Guinea Worm Warrior) who retired after leading the Center’s Health Programs since June 2016, including an important expansion of the Guinea Worm Eradication Program. Thank you, and Godspeed, Dr. Sienko!!

DEFINITIONS

Case of Guinea worm disease. A case of guinea-worm disease is a person exhibiting a skin lesion with emergence of a Guinea worm, and in which the worm is confirmed in laboratory tests to be *D. medinensis*. That person is counted as a case only once during the calendar year, i.e. when the first worm emerges from that person. All worm specimens should be obtained from each case patient for laboratory confirmation and sent to the WHO Collaborating Center at U.S. Centers for Disease Control and Prevention. All cases should be monitored at least twice per month during the remainder of the calendar year for prompt detection of possible emergence of additional guinea worms. [The same requirement for laboratory confirmation applies to some infections in animals.]

Contained case. Transmission from a patient with dracunculiasis is considered contained only if all of the following conditions are met for each emerging worm: 1) the infected patient is identified within 24 hours after 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 managed the patient properly; and 4) the containment process, including verification of dracunculiasis, is validated by a Guinea Worm Eradication Program supervisor within 7 days of emergence of the worm; and 5) the approved chemical temephos (Abate) is used to treat known or potentially contaminated surface water. Proper patient management includes cleaning and bandaging the lesion until the worm has been fully removed manually and by providing health education to discourage the patient from contaminating any water source. If two or more emerging worms are present, transmission is not contained until the last worm is removed. Similar criteria are in place for the containment of animal infections.

Presumed source of infection. A presumed source/location of a human dracunculiasis infection is considered identified if: 1) the patient drank unsafe water from the same source/location (specify) as other human case(s) or an infected domestic animal 10-14 months before infection, or 2) the patient lived in or visited the household, farm, village, or non-village area of a Guinea worm patient or infected domestic/peri-domestic animal 10-14 months before infection, or 3) the patient drank unsafe water from a known (specify name) 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 or not the patient's residence is the same as the presumed source/locality of infection should also be stated in order to distinguish indigenous transmission from an imported case.”

IN MEMORIUM



It is with profound sorrow that we report the passing of Edward Gyepi-Garbrah, who died on October 4, 2020 after a brief illness. He was the Focal Point for Guinea Worm Eradication in the World Health Organization's office in Ghana and had worked for more than a decade in support of the Ministry of Health's fight against Guinea worm disease. A dedicated Guinea Worm Warrior, before working for WHO he had worked in Ghana's Guinea Worm Eradication Program. We extend our sympathy and prayers to his family. We are glad he lived to see a Guinea worm-free Ghana.

RECENT PUBLICATIONS

Priest JW, Ngandolo BNR, Lechenne M, Cleveland CA, Yabsley MJ, Weiss AJ, Roy SL, Cama V, 2020. Development of a Multiplex Bead Assay for the Detection of Canine IgG₄ Antibody Responses to Guinea Worm. The American Journal of Tropical Medicine and Hygiene. 2020 Oct 26. doi: <https://doi.org/10.4269/ajtmh.20-0914>

Hopkins DR, Weiss AJ, Roy SL, Yerian S, Sapp SGH, 2020. Progress Toward Global Eradication of Dracunculiasis, January 2019-June 2020. Morbidity and Mortality Weekly Report. 69: 43 1563
https://www.cdc.gov/mmwr/volumes/69/wr/mm6943a2.htm?s_cid=mm6943a2_w

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. Dieudonne Sankara of WHO.

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<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
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