discussion. More than 75 participants attended the meeting, including director generals from each state ministry of health and SSGWEP senior program officers, the WHO representative in South Sudan Dr. Fabian Ndenzako, and UNICEF resident representative Ms. Hamida Laseko. Participants from The Carter Center included GWEP Director Adam Weiss, Sarah Yerian, Giovanna Steel, and others.

The SSGWEP has provisionally reported 3 Guinea worm infections in 2023: 2 human cases in Tonj East County of Warrap State and 1 infection in a genet in Lafon County of Eastern Equatoria State. All three infections were uncontained, and their sources of infection are unknown. South Sudan reported 6 GW infections in 2022 (5 humans, 1 dog) and 4 GW infections in 2021 (4 humans).

Figure 3:

On December 3rd, SSGWEP Director MAKOY Samuel Yibi participated as a panelist at the Last Mile Forum in Dubai, United Arab Emirates. The panel was entitled: Building Climate Resilient Health Systems, and Mr. Makoy discussed adaptations to climate in the SSGWEP (Figure #3).

MALI: 1 HUMAN CASE, 48 ANIMAL INFECTIONS

Mali has reported a confirmed Guinea worm case (uncontained) in a 9-year-old Bozo boy from the village of Gomitogo in Djenne district of Mopti Region, whose worm emerged on August 27, 2023. (The CDC laboratory confirmed this GW infection in December). The presumed source of his infection is local, but unknown, since the boy had no history of travel to an endemic area during his period of infection, and the most

Worm Eradication Program (MGWEP) who visited the child and his family at a seasonal fishing camp in

next round of live baboon trapping is scheduled for March 2024. Giovanna Steel, MA, and Drs. Obi Eneanya and Lexi Sack conducted a supervisory visit to Ethiopia in early December to help finalize plans for trapping and studying baboons and assess the status of program interventions. Ethiopia reported one GW infection, in a dog, in 2023.

CHAD AND MALI: SIMILAR BUT DIFFERENT

The Guinea Worm Eradication Programs in Chad and Mali face a *similar riverine ecology* in their main endemic areas along the Chari River and the inland delta of the Niger River, respectively, and the *same hypothesis of novel Guinea worm transmission* to humans and animals eating raw or under-cooked aquatic animals such as fish is believed to apply in both countries. In 2019-2023 however, Chad had 46 times as many GW infected dogs as Mali (5,131:112) and 15 times as many human GW cases as Mali (60:4), despite greater insecurity and uniquely significant interregional transport and marketing of dogs in Mali. Chad, with 29,392 dogs eligible for proactive tethering in 2022, has year-round GW transmission which peaks in May-June, vs. about six months transmission in Mali. Why the big difference in GW transmission in Chad and Mali? In theory, some of the difference in numbers of GW infections between the two countries could be due to differences in sensitivities of the national surveillance systems.

Three ecological features stand out. Although community-based seasonal collective fishing has been practiced widely in Chad for many generations, since 2012 dog GW infections in Chad have peaked at the end of the dry season, almost at the same time as collective fishing. Community-based collective fishing

stimated annual commercial fish production is nearly three times that of Mali (130 thousand tons vs. 47 thousand tons). Additionally, Chad reportedly has many more dogs than Mali. Some change in climate and/or fishing practices (e.g., use of smaller mesh fishing nets that capture smaller, copepod-feeding fish

	Chad	Mali
Surveillance (2022)		
Villages under Active Surveillance	2,434	2,216
Endemic area reward awareness	72%	82%
Interventions (2022)		
Safe water in 1+ villages	64%	100%
Abate application	95% (of 331 villages 1+)	100% (of 37 villages)
Proactive tethering began	March 2020	November 2021
Estimated proper fish waste disposal	53%	55%

-borne GW outbreaks in humans, but if water-borne transmission were the main mode of contracting infection in humans in Chad and Mali, there would have been more common-source outbreaks in humans. Chad averaged only 12 human cases per year in 2019-2023, with one large water-borne point-source outbreak in Bogam in 2019, while Mali had only 4 human cases in 2019-2023 and its most recent outbreak in humans was at Tanzikratene in 2014. The low-level dispersed transmission to humans in Mali and Chad suggests the alternative food-borne mode of transmission is the usual mode, especially among persons with no known epidemiological links to other human GW cases. In addition to several small human case clusters detected during this timeframe that may have resulted from water-borne exposure, the more frequent

human GW cases in Chad may be due to greater environmental contamination by fish waste containing fish guts, and the risk of human exposure to contaminated aquatic animals such as undercooked fish. Reducing the number of infected dogs should reduce the amount of GW larvae in the environment available to infect human and animal hosts in Chad, which reported over half (34/66) of all human cases worldwide in 2020-2023.

Figure 4:

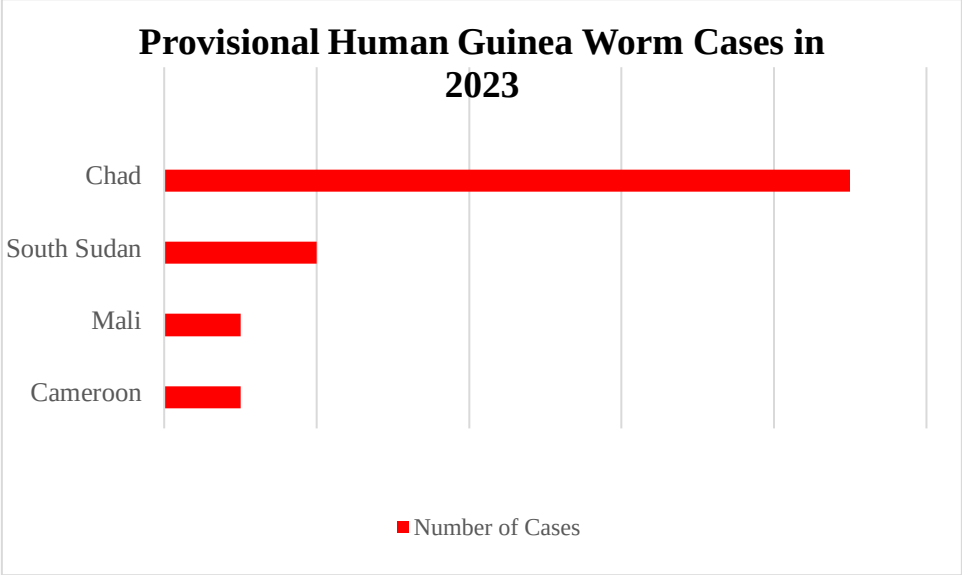

Figure 5:

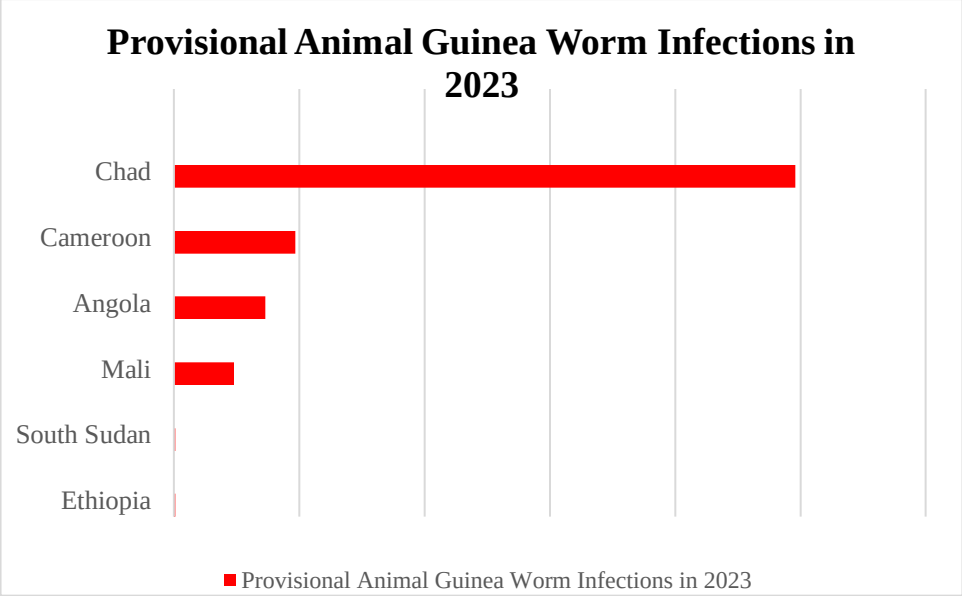

Table 1

Number of Laboratory-Confirmed Human 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

Note to contributors: