Waterborne Diseases: Guinea Worm

In the book "A Long Walk to Water", Salva returns to South Sudan to visit his father who is in the hospital from complications due to long term exposure to Guinea worm infestations. Guinea worms are a parasite that is ingested by drinking from contaminated water sources. To learn more about the Guinea worm in South Sudan, watch this video from the American Museum of Natural History: https://youtu.be/HCG0YxO5sJw The video can also be accessed from the website in Exercise 1.

EXERCISE 1: LEARNING ABOUT GUINEA WORM DISEASE You will need internet access to complete this exercise. Go to the following website: <u>https://www.amnh.org/explore/science-topics/disease-eradication/countdown-to-zero/guinea-worm</u>

Read the information from the American Museum of Natural History about Guinea worm and answer the questions below.

- 1. What is Guinea worm?
- 2. What are the symptoms of Guinea worm?
- 3. What are ways that people are working to eradicate the Guinea Worm?

"ON THE CUSP OF ERADICATION"

- 4. In 1986, Guinea worm disease was common in how many countries across Africa and Asia?
- 5. In 2015, Guinea worm disease was common in how many countries across Africa and Asia?



PAUSE AND REFLECT: Based on the video and what you have read so far, why do you think that the cases of Guinea worm disease have dropped so dramatically in the nineteen year time span from 1986 to 2015?

- 6. What is the nickname given to the Guinea worm?
 - a. Cuddly serpent
 - b. My parasitic, life sucking buddy
 - c. Fiery serpent
 - d. The Death Worm

7. Fill in the blanks of the life cycle of the Guinea worm below.



"THE CURSE OF THE FIERY SERPENT"



- 8. How do people remove the Guinea worm from their body?
- 9. What are some secondary problems that can occur from the emerging Guinea worm?

"WORM-FREE WATER"

- 10. Guinea worm disease is spread by tiny crustaceans in the water called ______
- 11. These tiny crustaceans thrive in stagnant ponds and lakes. Why is this a problem for the local communities?

12. What is the easiest way to remove the copepods from the water?

"TRACKING AND CONTAINMENT"

- 13. What are health workers doing to help eradicate the Guinea worm disease?
- 14. Why are patients suspected of having Guinea worm encouraged to go to "case containment centers"?



If you had a disease, would you be willing to go to a containment center for a few weeks in order to help protect your family, neighbors, friends, and community from that disease?

"HEALTH EDUCATION"

15. Many people in the African villages where Guinea worm is a problem cannot read. What are some ways that volunteers are helping to get the message out about Guinea worm disease?

"CHALLENGES"

- 16. What is making it difficult for health aid workers and volunteers to help eradicate Guinea worm in South Sudan and northern Mali?
- 17. What other challenges are aid workers facing in these areas? List at least 3.
 - a. _____
 - b. _____
 - c. _____
 - d. _____

"SUCCESSES"

- 18. The Guinea Worm Eradication Program is estimated to have prevented how many cases of the disease so far?
- 19. What are some of the impacts of the eradication program?
- 20. In the photo titles "Former Guinea Worm Patient", what does Abdulai Iddrisu no longer have to miss because of Guinea worm infections?



Reflect on what you have just read. What part of the article sticks out to you? Does anything in this article change how you feel about where you live? Do you consider yourself lucky to have clean water access daily? Do you consier yourself lucky to have free education and the ability to read? Write a short 8 to 10 sentence paragraph that describes your reflection after reading this article.

EXERCISE 2: DATA ANALYSIS

PART 1: Study the graph below and then answer the questions.



Number of Human Cases of Guinea Worm Disease Worldwide Since 1986, by Year

- 1. Approximately how many cases of Guinea worm disease were reported worldwide in 1986?
- 2. Given what you have learned about countries such as South Sudan, why do you think this number might be estimated and not 100% accurate?
- 3. How many cases of Guinea worm diseases were reported worldwide in 2018?
- 4. Of those cases, what percentage was located in South Sudan? Show your work.

PART 2: Like the United States, South Sudan is broken into States and Counties. The data in table 1 below is from the South Sudan Medical Journal, published in August 2012. It shows the 10 counties with highest Guinea worm cases in South Sudan in 2005. The chart beside it shows the States in which each of the counties is located. Use the data to answer the questions below.

Table 1. High endemic counties in South Sudan in 2005				<u>State</u>	<u>County</u>
	County	No of cases	% of total	Eastern Equitoria	Kapoeta North
			cases		Kapoeta East
1	Kapoeta North	2,605	46.8		Kapoeta South
2	Awerial	699	12.6	Lakes	Awerial
3	Gogrial West	481	8.6		
4	Kapoeta East	398	7.2	Warrap	Gogrial West
5	Tonj North	235	4.2		Tonj North
6	Tonj East	197	3.5		Tonj East
7	Fangak	165	3	Jonglei	Fangak Pibor
8	Wau	150	2.7		
9	Kapoeta South	128	2.3		
10	Pibor	121	2.2	Western Bahr el Ghazal	Wau

Figure 1 from Lado, et al, 2012

- 1. Which state had the greatest total number of cases in 2005? How many total cases were there?
- 2. Which state had the least number of cases in 2005? How many total cases were there?
- 3. Look at the map of South Sudan on the next page. It shows the migration routes of refugees into and out of South Sudan. Based on information from the map, and what you have learned in reading "A Long Walk to Water", why do you think that there are more cases of Guinea worm disease in Eastern Equitoria than anywhere else in the nation? Why do you think there are so many fewer cases found in Western Bahr el Ghazal?



RESOURCES USED FOR WORKSHEET:

LESSON 1:

American Museum of Natural History. (2019). Guinea Worm. Retrieved July 22, 2020, from https://www.amnh.org/explore/science-topics/disease-eradication/countdown-to-zero/guinea-worm

LESSON 2:

- The Carter Center. (2018). Number of Human Cases of Guinea Worm Disease Worldwide Since 1986, by Year. Retrieved July 22, 2020, from <u>https://www.cartercenter.org/resources/pdfs/news/health_publications/guinea_worm/guinea-</u> <u>worm-cases-by-year-from-1989.pdf</u>
- Lado, M., Mackoy, S., Steve, B., & Rumunu, J. (2012). Evaluation of community-based surveillance for Guinea worm, South Sudan, 2006. South Sudan Medical Journal, Vol. 5(No. 3), August 2012, 72-74.
- REACH. (2018, March). *Situation Overview: Regional Displacement of South Sudanese* [PDF]. CHÂTELAINE, SWITZERLAND: REACH Initiative.