Schistosomiasis is the second most destructive parasitic disease, following malaria. Often considered a Neglected Tropical Disease, Schistosomiasis infects more than 200 million people worldwide according to the Center for Disease Control. Schistosomiasis refers to the trematodes Schistosoma, often considered the agent in the epidemiological triangle. The difficulty with schistosomiasis is that it has two hosts, the human as well as the snail. As a result, transmission of the disease requires an interaction between small habitat and human activity.

Seasonality of Schistosomiasis

Schistosomiasis Counts vs. Accumulated Rainfall (Ghana, 2013)

Methodology

The main factor in determining small prevalence examined by this project was rainfall. Using images from the Tropical Rainfall Measuring Mission (TRMM) provided by the National Aeronautics and Space Agency (NASA), monthly accumulated rainfall was calculated. Zonal statistics were then used on the images to relate them to the geopolitical boundaries of the 170 districts in Ghana. A similar process was taken to gather schistosomiasis counts. The data provided by Ghana Health Services was not up to date with the 170 districts in Ghana. A similar process was taken.

Results

Looking at the accumulated rainfall as compared to schistosomiasis counts for 2013 allows us to visualize two of the major challenges in the spatial extent of this project: first, the necessary division between sub-Saharan versus Saharan climate and second, the “schistosomiasis time lag.”

Conclusion

Considering the challenges faced in determining the seasons, further research should include a Fourier analysis of schistosomiasis counts at a lower districts level to create the most accurate base curve for disease prevalence. For such analysis, seasons should be separated by Saharan and sub-Saharan weather conditions. Additional weight should also be given to environmental factors such as the normalized difference vegetation index, temperature, and land use classifications. Socioeconomic conditions could include the availability and use of protected water sources versus unprotected, the contamination of nearby water ways, and the proximity to health facilities. The time frame of this project was limited to a one year period, however, additional years may provide more contextualized models for the seasonality of schistosomiasis in Ghana. A more in-depth analysis is necessary and worthwhile as seasonality has been shown in diverse locations such as China, Brazil, Nigeria and Ethiopia.