Spatio-Temporal Patterns of Cholera Occurrence in Malawi, Africa

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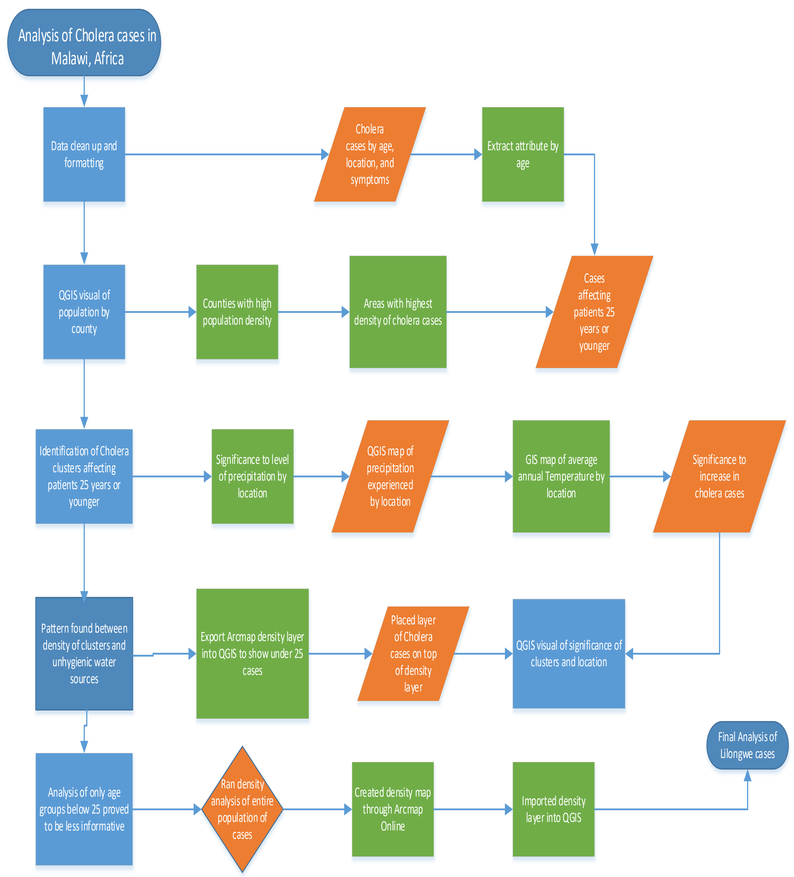
Abstract

Cholera is an acute intestinal infection which is contracted by drinking water that has been contaminated by an infected person's fecal bacteria, or the consumption of contaminated food. The transmission of fecal contamination is a result of poor sanitation, due to this Cholera is a threat to countries around the globe which do not have secure access to clean drinking water or assured sanitation. Since the re-emergence of Cholera in Africa in the 1970's in Ghana, the disease has been posing a continuous public health burden for most African nations. Between 1999 and 2005, a total of 26,924 cases and 620 deaths were reported officially by the World Health Organization (WHO). In addition to human suffering, and loss of lives, Cholera outbreaks and epidemics also causes panic, disrupts socio-economic activities, can cause slowing of development activities in affected areas and causes diversion of significant amount of monetary resources to tackle this problem, which otherwise would go towards economic and human development (Anamzui-Ya, 10).

The main objectives of this study are to analyze the spatial and temporal patterns of Cholera occurrence in Malawi, during 2017-18 Cholera season. Results clearly show that Cholera occurrence has seasonality, affects people younger than 25 years in age more, and occurs in clusters in most instances. Identifying the high risk areas through cluster analysis will be useful for government health agencies on the ground to develop and implement educational and outreach activities that emphasize the importance of water quality, sanitation, and personal hygiene in preventing Cholera.

Methods



Results

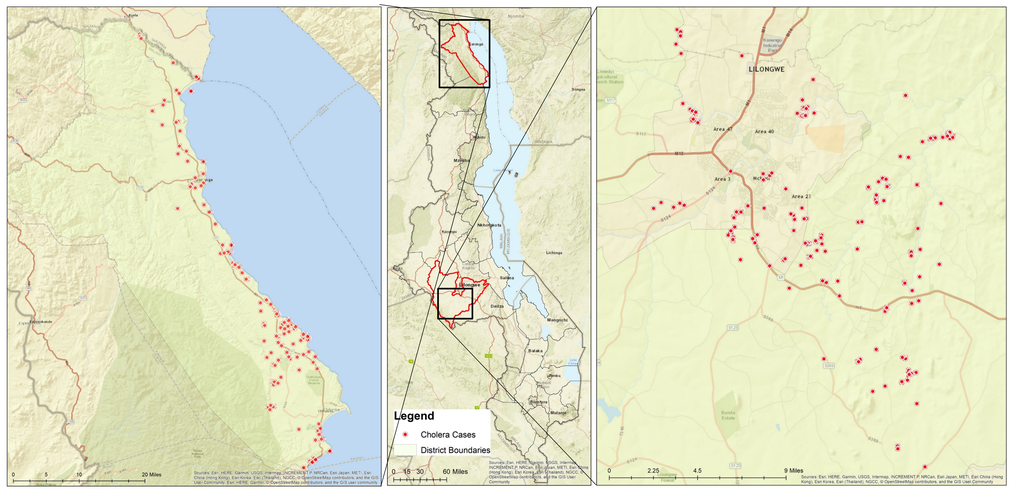


Figure 1. Mapped Cholera Cases during 2017-18 Cholera Season in Malawi. Majority of cholera cases were reported in Lilongwe and Karonga districts.

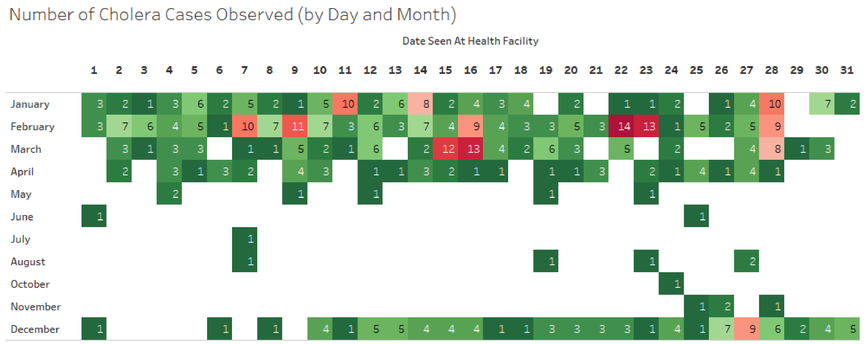


Figure 2. Number of cholera cases observed by month and day reported. January and February have reported the maximum number of cases.

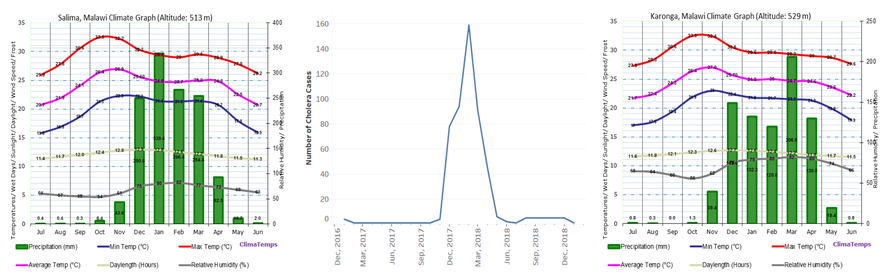


Figure 3. The climate graphs for Salima (near Lilongwe) and Karonga districts show variability in climatic variables through the year. Distinct rainy season starts from December and ends in April with the rest of the year remaining dry. Number of Cholera cases correlate well with the increasing rain during the year.

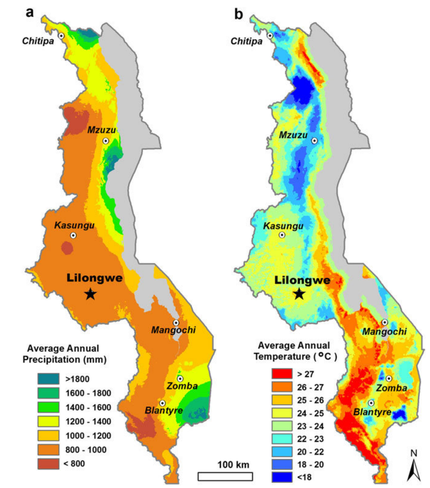


Figure 4. Average annual temperature and precipitation conditions in Malawi, Africa (Guiying et al, 2017)

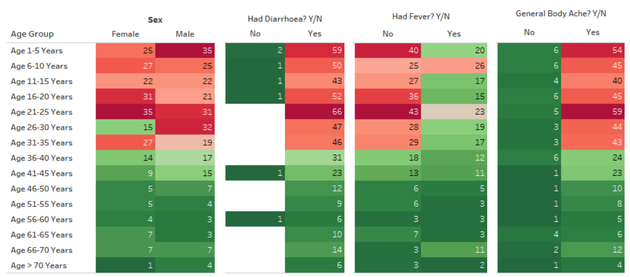


Figure 5. Cholera related symptoms experienced by patients by age group shows that younger people (under 25 years of age) are affected more. Majority of the Cholera patients reported having diarrhea (99%) and body ache (90%) and only 60% of them reported fever.

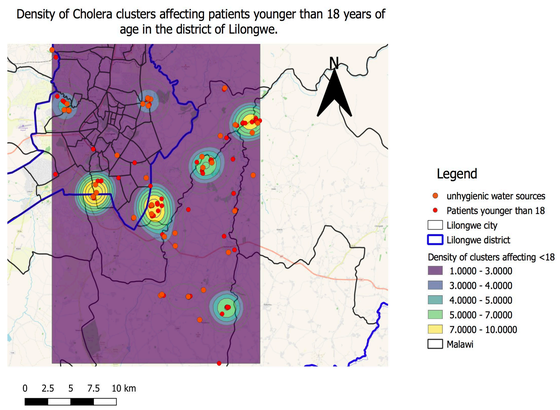


Figure 6. Hot spots of cholera cases affecting ages younger than 18.

Conclusion

- Total of 488 cases of cholera reported. Of these, only 74 (15.2%) reported not having a functional toilet facility available
- 238 cases reported not having any previous contact with an infected source before becoming sick (48.8%)
- Average duration of Illness from the date of onset of symptoms experienced by patients was about 4 days
- Of the 281 water sources mapped as being the primary source of water for the Cholera patients, 117 (41.6%) were categorized as "unhygienic"
- People of younger age are most vulnerable. Ages 1-5 shows the highest risk of infection.
- Seasonality of this disease makes prediction of an imminent outbreak possible

References and Data Sources.

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All data was retrieved from Dr. Muthukrishnan