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Background: The recent epidemic of Ebola in West Africa has become the largest ever in history, killing more than 5,000 people. The epidemic has mainly affected three countries Liberia, Sierra Leone, and Guinea and has prompted an international response to halt the further spread of the epidemic. Several governments have promised aid in the form of military personnel, healthcare workers, and treatment beds.

Goal: The goal of this study is to determine optimal treatment site placement to mitigate the spread of Ebola in West Africa for different potential outcomes (explore different what if scenarios).

Expected Results: Maps comparing different site placements for one or each of the countries affected by Ebola for different scenarios.

Potential approach

- Collect geographic information of current hospital network in each country (or in one of the affected countries)
- Gather epidemiological data for Ebola (e.g., incubation period, infectious period, treatment effectiveness)
- Gather information regarding hospitalizations a
- Gather information regarding aid promises from different governments around the world (e.g., United States, United Kingdom)
- Develop a model (e.g., Susceptible-Exposed-Infected-Recovered (SEIR) type model or a statistical model)
- Perform sensitivity analysis with regards to parameter ranges
- Analyze different site placement algorithms (e.g., maximum coverage – maximize the total number of people within a specified distance, minimum distance – minimize the distance from each individual to the nearest treatment center)

Bonus approach

- Estimate the potential economic impact of each strategy proposed
- Analyze optimal deployment schedule (e.g., how many beds should be deployed per week or month to halt the overall spread)