CIS 671 : Information Visualization

GEOSPATIAL ANALYSIS OF HEALTH FACILITY DISTRIBUTION IN KENYA: A COUNTY-LEVEL ASSESSMENT

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Introduction

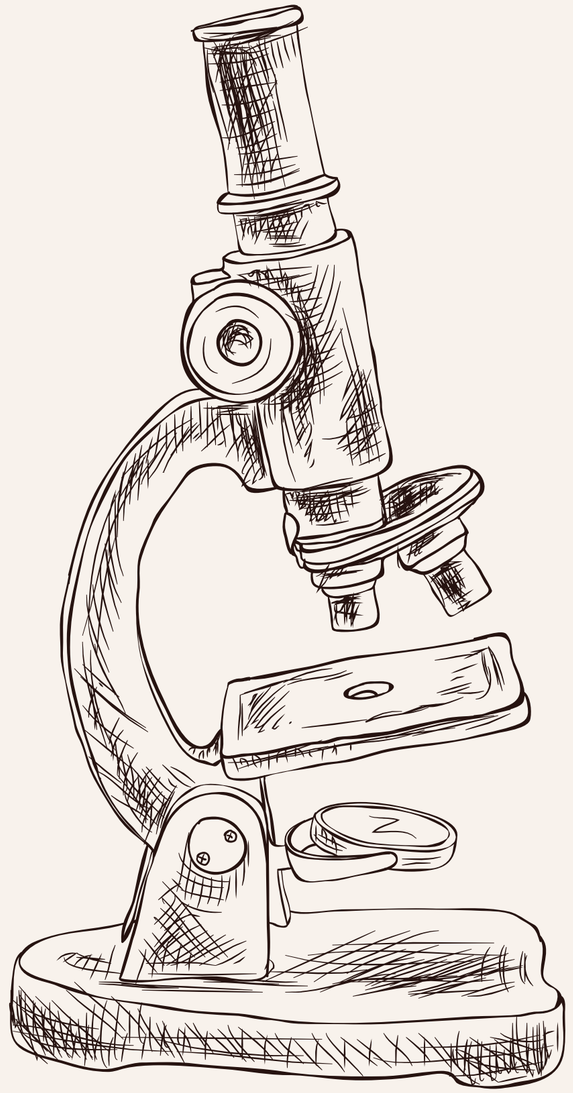
The geographic location of health facilities influences the health acess and health behaviors of individuals in the specific geographic area. Because of this there is a direct relation between health facility distribution and resulting health outcomes.

Data visualization plays a key role in the determination of health facility distribution, identification of underserved areas and in informing decision-making on where to establish new health facilities.

Our primary audience for the paper is Miss Kamul, the Regional Operations Manager of Health International. Our secondary audiences include health researchers, community health workers training agencies, the Ministry of Health, county health departments, health NGOs and other health organizations

Methodology

- The datasets used in the study are Health Facilities and Infant mortality rate datasets.
- Python programming was utilized to perform analysis of the data and to plot visualizations.
- Overview and navigation techniques used include Chainsaw, Combine and Zooming.

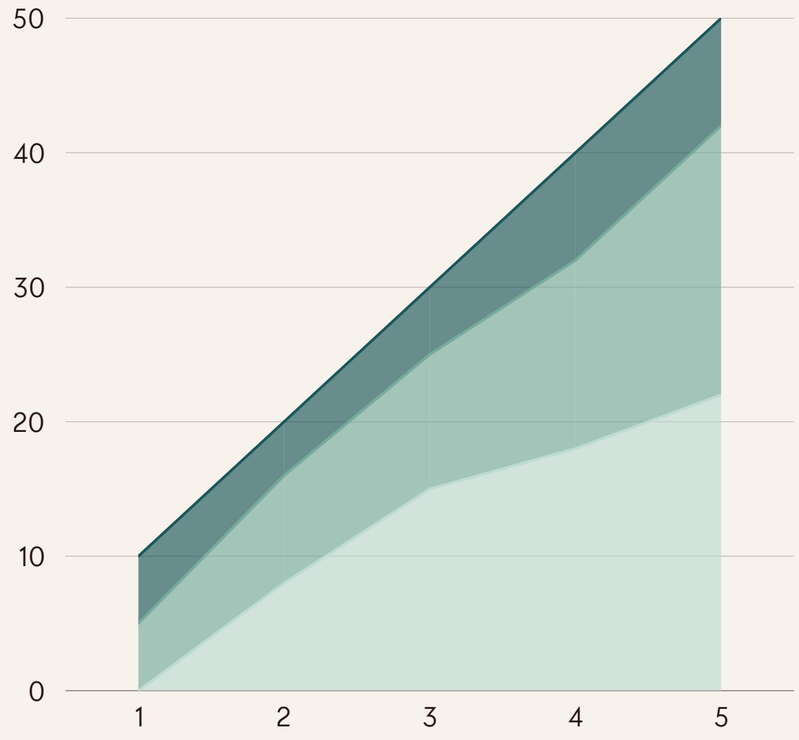


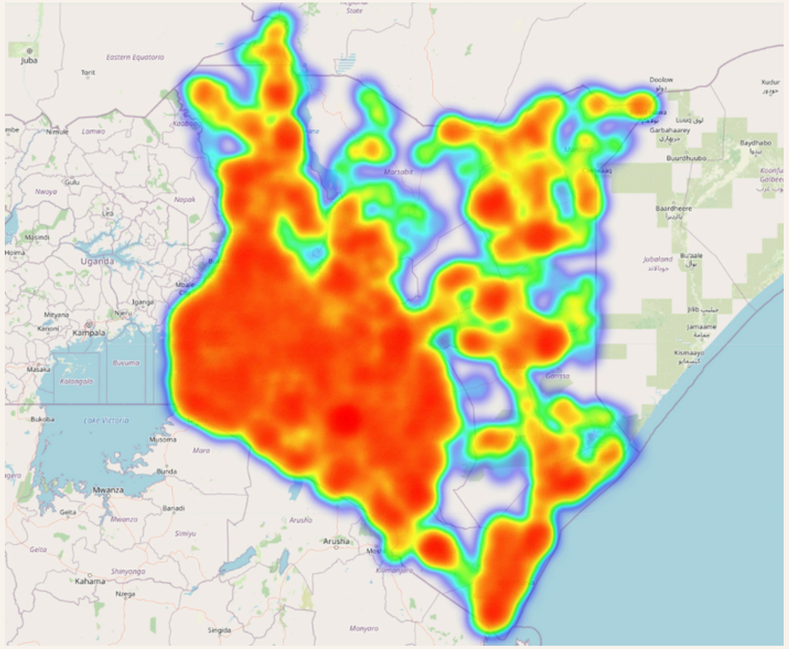
Project Tasks

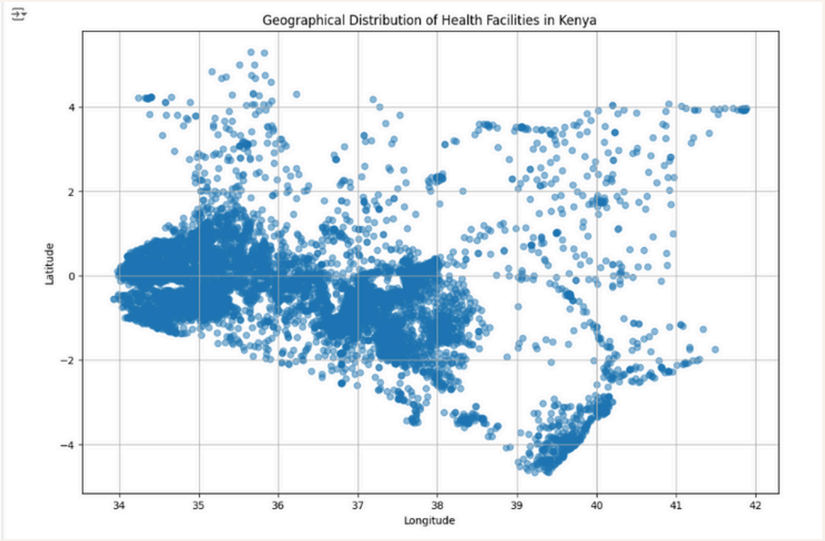
01 What is the current distribution of health facilities in Kenya per county?

02 (a)What are the ten counties with the least number of health facilities? (b)What are the ten counties with the highest mortality rates?

03 Comparison of male vs female infant mortality rates per county.







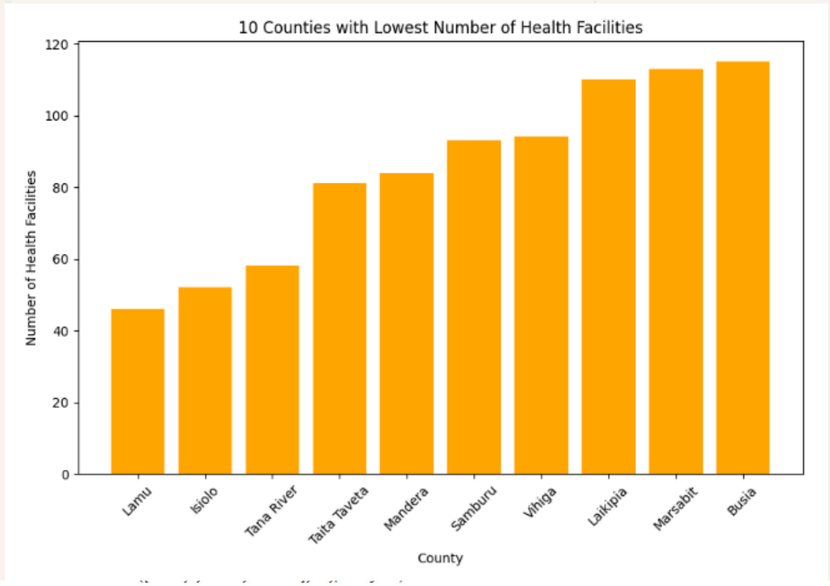
Current geographic distribution of health facilities in Kenya per county

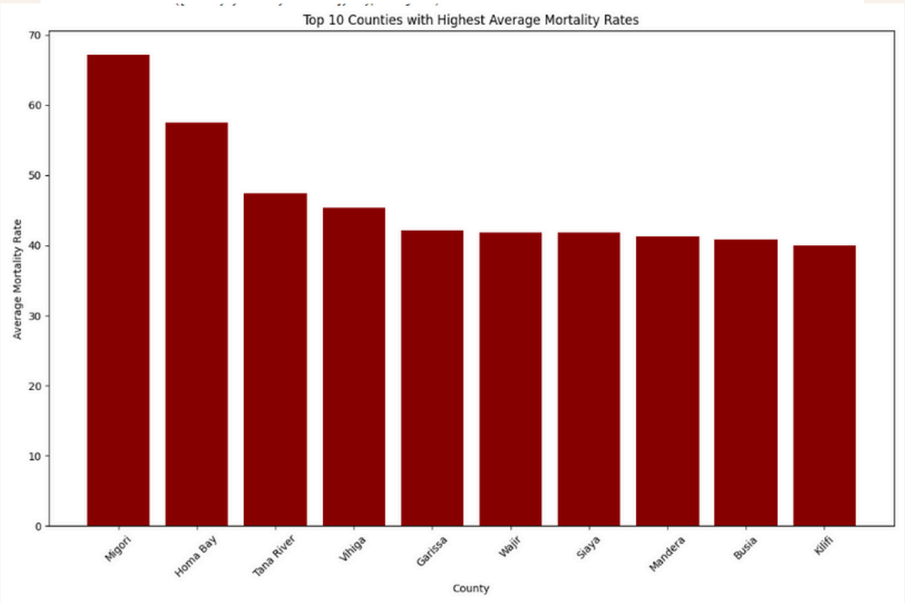
Visualization: Heat map and Scatter plot

Target Audience: Miss Kamul, Researchers, Health NGOs, Community Health Workers training agencies

Insights: The Northeastern and Southeastern parts of Kenya have the lowest/ poorest distribution of health facilities.

Decision: Counties to consider for selection of health facility building need to be in these two regions of the country.



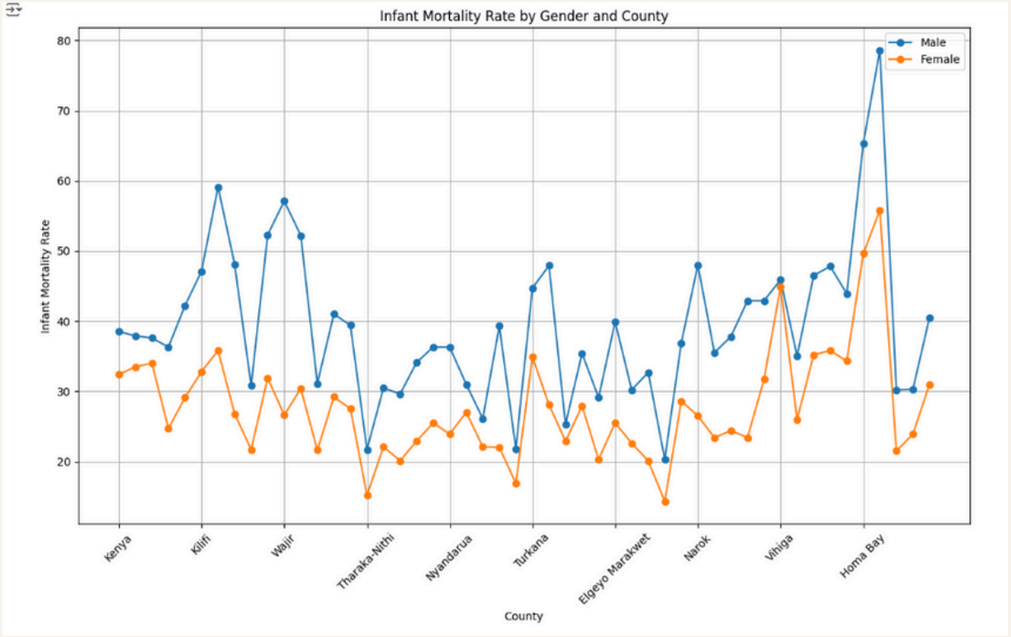


What are the ten counties with the least number of health facilities? What are the ten counties with the highest mortality rates?

Visualization: Bar charts

Target Audience: Miss Kamul, Department of Budget allocation at Ministry of Health, Health NGOs providing CHWs and Mobile clinic services, Doctors looking to work with underserved communities

Insights: Tana River, Vihiga, Busia and Mandera are the four counties with both the lowest number of health facilities and highest infant mortality rates



Comparison of male vs female infant mortality rates per county

Visualization: Line Graph

Target Audience: Miss Kamul, NGOs championing for Boy child rights, Researchers, Health NGOs

Insights: Unlike other countries, female infants have a lower mortality rate compared to male infants.

Decision: To introduce health education initiatives on caring for boys in their first 5 years of life. Engage a researcher to determine the reason for this unusual/ unexpected trend

Conclusions

01

The integration of geospatial analysis and effective visualizations can lead to making informed decisions that have huge positive or negative health outcomes on populations.

02

The insights picked from the line graph provide a surprising view on the trends of male vs female infant mortalities.

03

In the future, we will work on integration of more specific data such as road network and populations dataset to help verify the outcomes yielded from the visualizations above.