Geospatial Innovations in Health Research: Advancing Public Health Solutions in Ghana

Efiba Vidda Senkyire Kwarteng[1,2], Samuel Ato Andam-Akorful[2],
[1]Regional Transport Research and Education Centre Kumasi (TRECK),
2Geospatial Innovation and Research Centre, Kumasi (GIRCK)
Department of Geomatic Engineering
Kwame Nkrumah University of Science and Technology, Kumasi
Samuel Ato Andam-Akorful: aakorful@gmail.com

Abstract

Geospatial technologies present significant opportunities to address public health challenges, particularly in low-resource settings like Ghana. This presentation explores the emerging potential of the Geospatial Innovation and Research Centre, Kumasi, which aims to become a leader in integrating geospatial tools with public health research to create innovative, data-driven solutions.

Early research efforts have focused on lymphatic filariasis (LF) elimination and pediatric cancer surveillance. Work on LF highlights the use of advanced spatial analytics, including Bayesian smoothing, Species Distribution Models (SDMs), and cluster analysis, to identify transmission hotspots and evaluate the effectiveness of mass drug administration (MDA) programs. Initial findings reveal notable geographic disparities in LF prevalence, with persistent endemicity in the Guinea Savannah and Transition zones, underscoring the need for stratified, geography-specific elimination strategies.

Additionally, spatial analyses of pediatric cancer data using kernel density estimation and Ripley's K function have uncovered clustering patterns in southern Ghana. Environmental and genetic interactions appear to influence these clusters, with significant hotspots identified in the Ashanti Region. These findings demonstrate the potential of geospatial tools to guide targeted interventions, optimize resource allocation, and inform strategic healthcare infrastructure development.

The presentation emphasizes the Centre's emerging role in leveraging Geographic Information Systems (GIS) for public health advancement. By fostering multidisciplinary collaborations and driving innovation, the Centre aims to bridge critical gaps in healthcare delivery. As it grows, it holds immense promise to transform public health outcomes in Ghana and beyond, providing scalable models for addressing similar challenges globally.

Geospatial Innovations in Health Research: Advancing Public Health Solutions in Ghana
Efiba Vidda Senkyire Kwarteng[2], Samuel Ato Andam-Akorful[1,2],
[1]Regional Transport Research and Education Centre Kumasi (TRECK),
[2]Geospatial Innovation and Research Centre, Kumasi (GIRCK)
Department of Geomatic Engineering
Kwame Nkrumah University of Science and Technology, Kumasi

GGS conference 2024.
Geospatial Excellence for Digital Growth: Fostering Innovation and Collaboration to Unlock Ghana's Potential
Accra, Ghana, 28-29 November, M.T. Addico Conference Hall, Ghana Shippers' Authority